FOOD INDUSTRIES

TECHNOLOGY DEPT!

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● FOR THOSE WHO CONTROL QUALITY THROUGH MANAGEMENT AND PRODUCTION

FEBRUARY 1943

Picture Flowsheet For Dehydration

Compressing Dehydrated Foods

How to Stretch the Life of Rubber

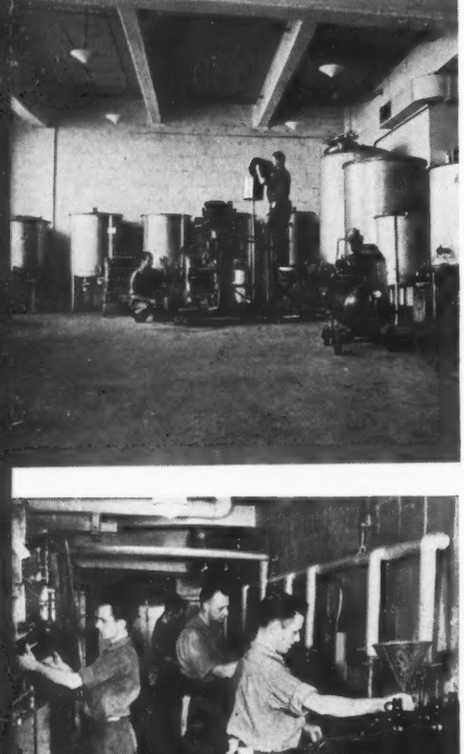
Quick Freezing Cooked Foods

Britain's Wartime Food Industry

Technology of Pickle Production

McGRAW-HILL PUBLICATION

BACKGROUND VALUES . . . a PART of the product, APART from the price



IT'S important to buyers to know the answer to: *What happens to an essential oil once it enters the Fritzsche plant?* We say this because what *does* happen to these oils and aromatic chemicals has a very direct bearing on the quality, economy and ultimate satisfaction that derives from their purchases of our products. So, here's the story:

Immediately a shipment reaches our New York Receiving Department, whether of our own manufacture or from outside sources, each container is unsealed and the contents sampled. These samples are sent to our Control Laboratories where they are analyzed and carefully checked against standard control specimens. Before final acceptance for use in compounding or for sale, they undergo anywhere from six to a dozen or more rigid inspections and tests. If the samples are found to meet all specifications, the shipment is bulked, thoroughly cleaned by centrifuging and stored in huge glass lined tanks in an atmosphere ideally regulated for storage.

From here on, our aim is to see that these strictly pure but delicate oils and aromatics reach our customers in perfect condition to give the best possible value for their money. To insure this requires scrupulous cleanliness and care in handling. All containers are thoroughly cleansed by washing and steaming. Then, orders are filled in our air conditioned Sub-Division Laboratory where hundreds of different items are carefully weighed, packaged and labeled each day. A special tamper-proof top—an exclusive feature of our packaging—gives final protection to the contents of every bottle bearing our name. Efficient packing sends each order from our Shipping Department quickly and safely toward its destination—in most cases, the same day the order is received.

It costs the buyer no more to avail his company the advantages of outstanding quality plus prompt, accurate, efficient service, as these are all a PART of Fritzsche products, APART from their price!

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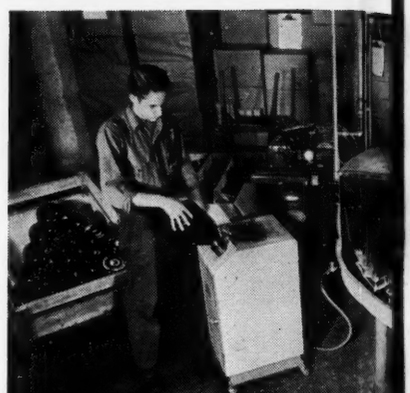
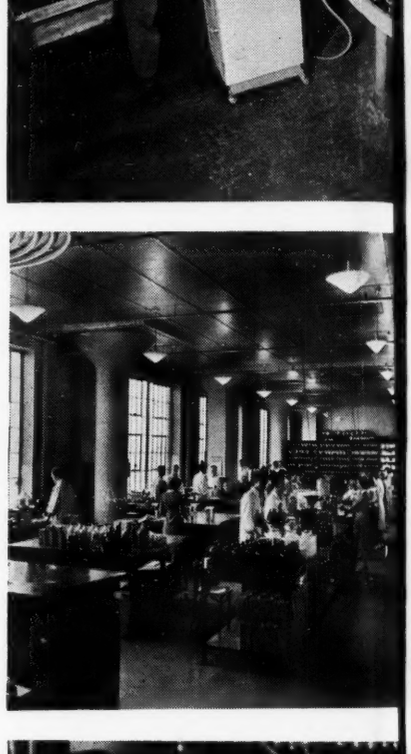
In Our Country's Service





TECHNOLOGY DEPT.

FEBRUARY
FOOD TECHNOLOGY

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THE COVER

There comes a time in the daily operations of every soldier when he must lay down his gun and revive his fighting strength with food. To the private pictured on the cover, the can of field rations is just as essential as bullets. *(Photo by Wide World.)*

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★ ★ ★ CHANGE OF ADDRESS ★ ★ ★

McGRAW-HILL PUBLISHING COMPANY
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Director of Circulation:

Please change my address on "Food Industries"

From .....

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To .....

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Signed .....

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You can help make the machinery you now operate last much longer without trouble, delay and expense of repairs and replacements, by using Lubriplate lubricants.

Reports from industry everywhere are telling how Lubriplate lubricants are helping to prevent shut downs and repairs. Some of these stories are almost beyond belief.

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We are sorry we cannot supply your present needs for IngAclad Stainless-Clad Steel, unless you are in the fortunate position of holding high-rated war orders. You will be glad to know, however, that every ton you are denied today is serving America in actual war work . . . on the sea in ships galleys . . . in the camps as jacketed food kettles . . . and in speeding and protecting Food Products, Chemicals, Textiles, etc. for the fighting services.

IngAclad makes good consumer products better, and protects them at every handling stage. Plan now to take advantage of the economies IngAclad offers when peace comes.

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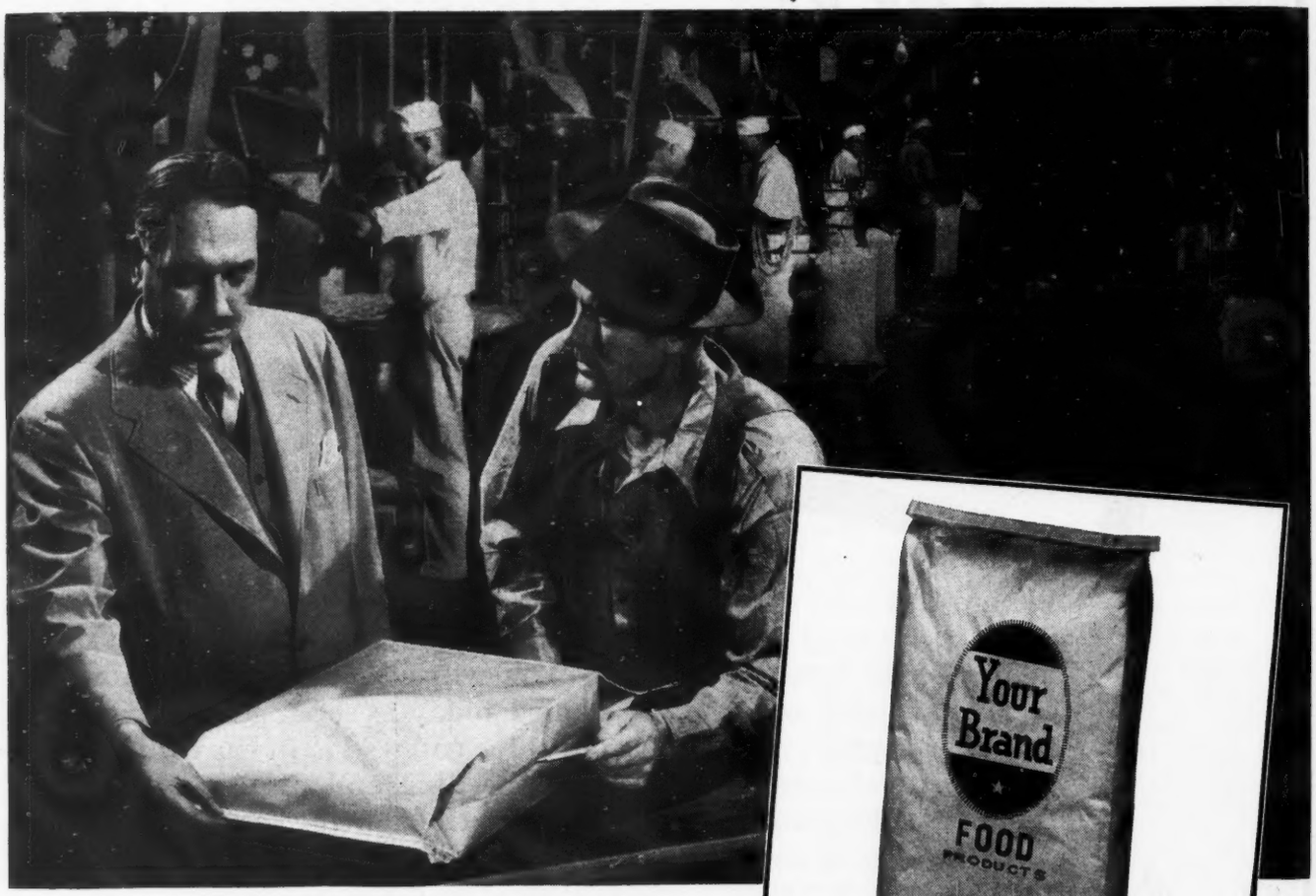
That's what a bag user said after one of our Multiwall Paper Bag experts visited his plant and solved a troublesome packaging problem which had been stealing his profits.

The counsel of our staff covers every phase of packaging by the bag . . . the bags themselves, filling and closing, shipping and storage. Our experts can give competent advice on these subjects because they *know* every angle of packing and shipping. Often they show manufacturers how to increase production and cut costs in the packing room.

Services of our experts are available to you without cost or obligation . . . whether you're a Bemis customer or not.

Next time you have a packaging problem, write or wire our nearest office. We'll have an expert on the job promptly . . . and it won't cost you a penny!



Bemis representatives are the kind of men who take off their coats and tackle a problem from a practical, experienced point of view.

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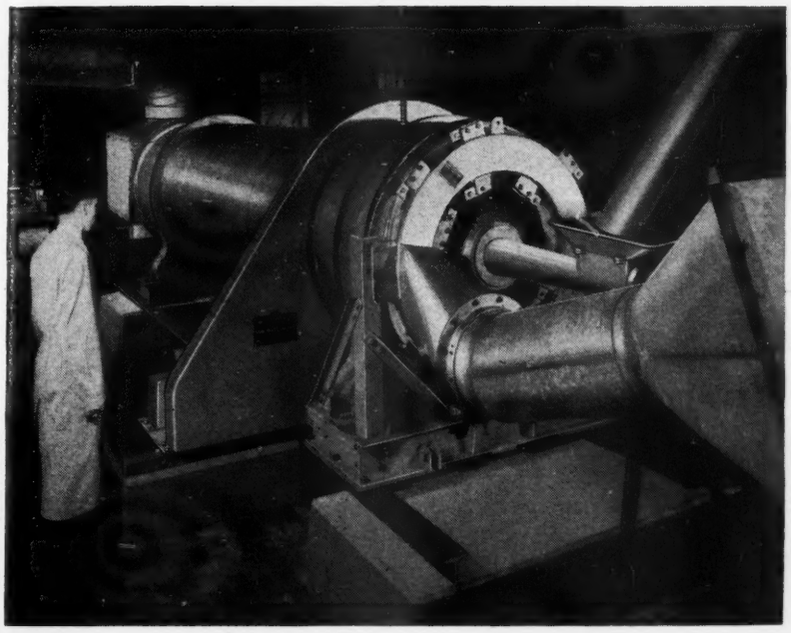
LINK-BELT ROTO-LOUVRE DRYERS

DEHYDRATE PORK

at Swift & Company



Following the application of the Link-Belt Roto-Louvre Dryer to their process for dehydrating beef, Swift & Company are now dehydrating pork with this unit. The method used for pork is essentially the same as that for beef, with the addition of new processes involving the separation of rendered pork fat and recombining the meat juices with the meat. See diagram below.

LINK-BELT COMPANY

Chicago, Indianapolis, Philadelphia, Atlanta, Dallas, San Francisco, Toronto

Offices in principal cities

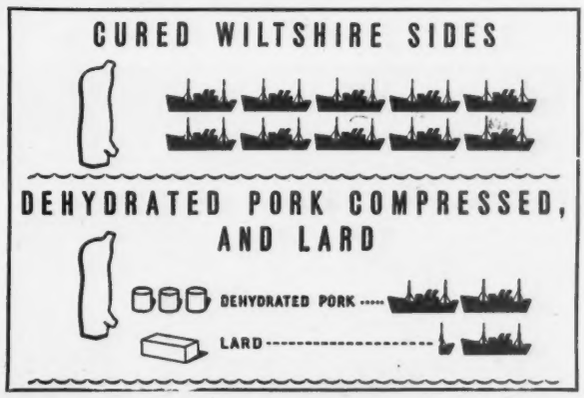
SAVES CARGO SPACE

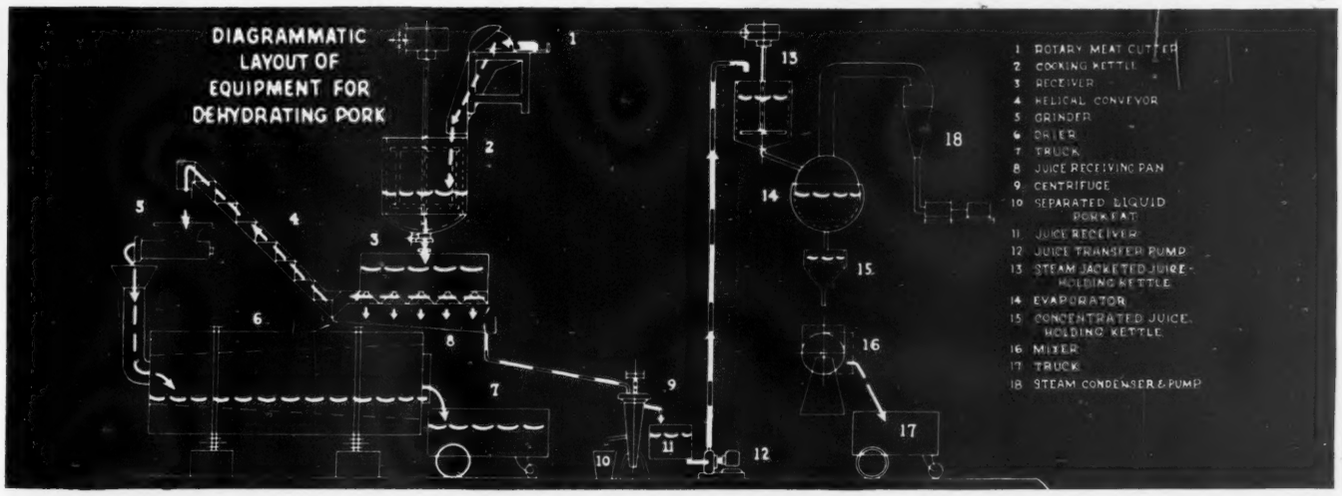
Where 10 ships have been needed to carry pork as cured Wiltshire sides, 3.12 ships will carry the same amount of meat, in dehydrated form, and the meat fat as lard. The dehydrated meat will require only two ships, and the lard, 1.12 ships. 9016

Shown above is one of the Link-Belt Roto-Louvre Dryers now in service at Swift & Company's Chicago plant dehydrating both beef and pork. The Roto-Louvre Dryer is the dehydrating unit into which the cooked, ground, fresh meat is fed and from which emerges the dehydrated products. This dryer has proved highly successful in drying foods of all kinds. It provides a continuous process with positive control from the time the food product enters the drum to its discharge. Send for Book No. 1911.

★ ★ ★ —

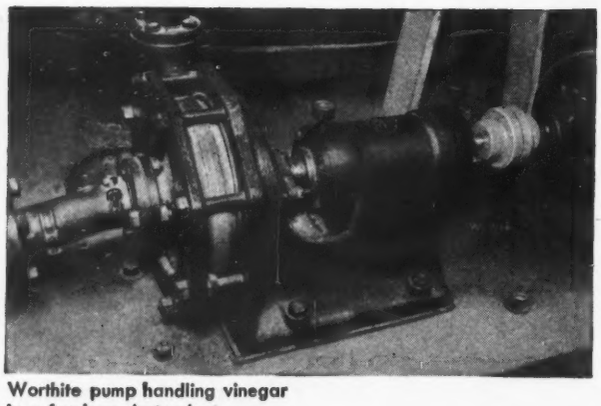
After being cut into 2″ cubes and cooked, the meat from which the juice has been separated, is then ground and fed to the Roto-Louvre unit (dehydrator). This dryer consists essentially of a horizontal drum fitted with louvres running the length of the interior. Air at controlled temperatures is admitted beneath the louvres and blown through the granular meat. The drum revolves so that the meat keeps turning and moves slowly down the slight incline of the barrel where it sifts at the far end to a sanitary metal truck (No. 7).



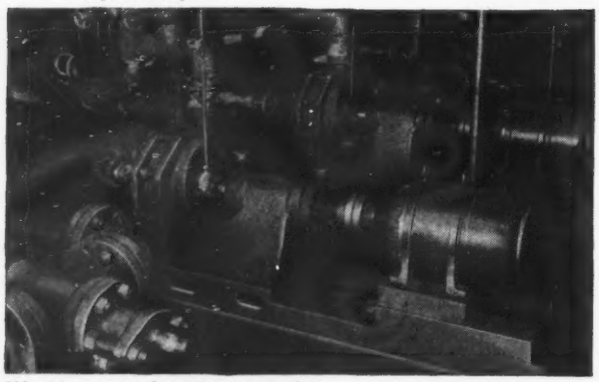


LINK-BELT ROTO-LOUVRE HEAT DRYER

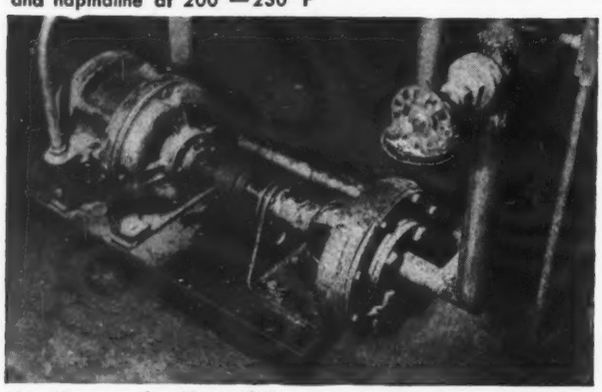
» NO CORROSION
» NO CONTAMINATION
» NO OUTAGES
with WORTHITE



Worthite pump handling vinegar in a food products plant



Worthite pumps handling tar acids and napthaline at 200°—230° F



Worthite pump handling sulfuric acid and sulphurated oil

CP3-5

PUMPING EQUIPMENT

IF your processing involves pumping almost any kind of corrosive liquor you'll find this alloy, **WORTHITE,** as used in Worthington Pumps, will give you long, trouble-free service. It is already widely used in many industries—explosives, dyestuffs, acid manufacture, fertilizers, paper, pulp, petroleum, coke by-products, metal refining, pigments, plastic, rayon and food products. Other important uses are being continuously found.

WORTHITE is a complex alloy jointly developed by the metallurgists of Lebanon Steel Foundry and Worthington Pump and Machinery Corporation.

WORTHITE pumps are available to those processors whose war production activities give them priority.

Our descriptive bulletins on **WORTHITE** pumping equipment offer ideas and information which you can use in planning new or expanded processing operations.

Both the Navy E and Army-Navy E Awards have been presented to Worthington for speed and excellence in production.

WORTHINGTON

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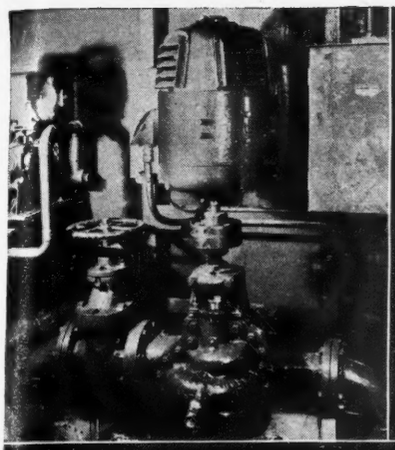
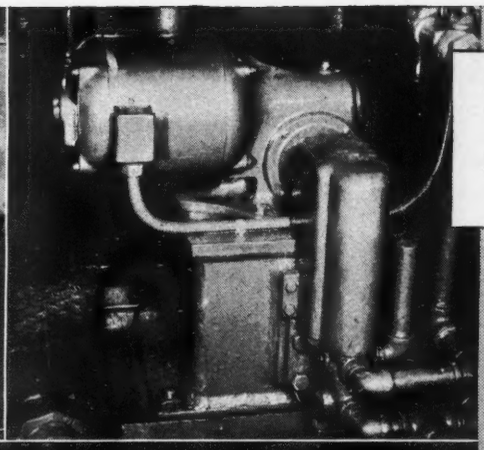
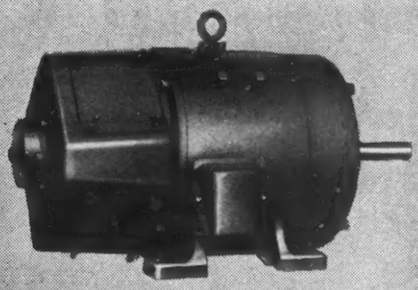




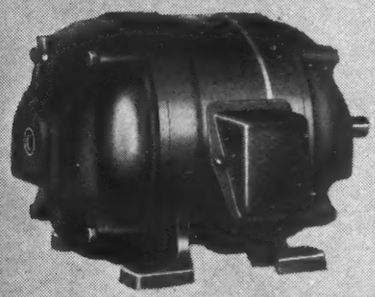
Extreme Left—Century 7½ horsepower, vertical mounted, direct current, drip proof water pump motor.
Left — Century ½ horsepower motor driving a Diesel oil pump.

CENTURY MOTORS and GENERATORS

For the Toughest Sea-Going Service Meet the Rigid War Requirements of Naval and Merchant Marine Applications



7½ horsepower, direct current, ball bearing, fabricated steel, water proof Navy motor.



Century 2 horsepower squirrel cage fabricated steel motor with cast steel end brackets.

Century shipboard motors and generators are built to stand up under

- The toughest sea-going service
- The shocks of gunfire and bombing
- The rigorous climatic conditions of the seven seas

They meet Navy Specifications 17M10 and 17M17, A.I.E.E., recommended practice on shipboard No. 45, and the Maritime Rules of Shipping.

Century Motors' famous ability to "keep a-running" is daily being demonstrated and thoroughly proven on the high seas in applications such as those mentioned above.

Your nearest Century Application and Service Engineer will gladly tell you all the advantages of Century Motors for *any* job.

Century MOTORS

Help You Beat the Production Promise

CENTURY ELECTRIC CO.
1806 Pine Street, St. Louis, Mo.
Offices and Stock Points in Principal Cities

Among the many Naval and other marine applications of Century Motors that have been made and are being made today are the following:

Diesel fuel pump motors
Bilge pump motors
Transfer pump motors
Brine pump motors
Cooling water pumps
Fire pump motors
Capstain motors
Hoisting machinery motors
Pumps for fresh water stills
Air compressor motors
Refrigeration compressor motors
Steering gear motors
Fan and blower motors
Oil burner motors
Generators and motor generating sets for light, power, and communication
Workshop machinery motors

308

One of the Largest Exclusive Motor and Generator Manufacturers in the World.

Old Glory will fly on tomorrow because this flag flies today

We are *all* carrying this "Battle Flag of Freedom" at Wright's these days, and we are carrying it with well over 10% of our total salaries and payroll *every* payday.

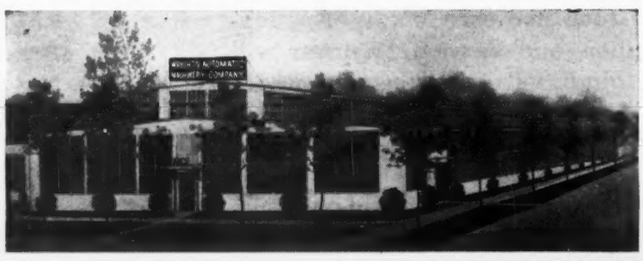
Our more than 700 employees are doing a war job too—a job that engineering skill and precision manufacturing experience has qualified them to do—well.

. . . Wright equipment in the hands of our customers, with proper care and attention, should outlast this war, and War Bonds purchased today will provide funds for finer automatic packaging machinery tomorrow.

On repairs and maintenance we are equipped as always, to *serve.*

Holder of the Coveted Treasury Flag

ESTABLISHED • 1893 •



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DURHAM CABLE ADDRESS YONWRIGHT NORTH CAROLINA, U. S. A.

The more Timken Bearings you have in your machines the better they will work for Victory. Redesign now. Meet post-war conditions on a sure footing.

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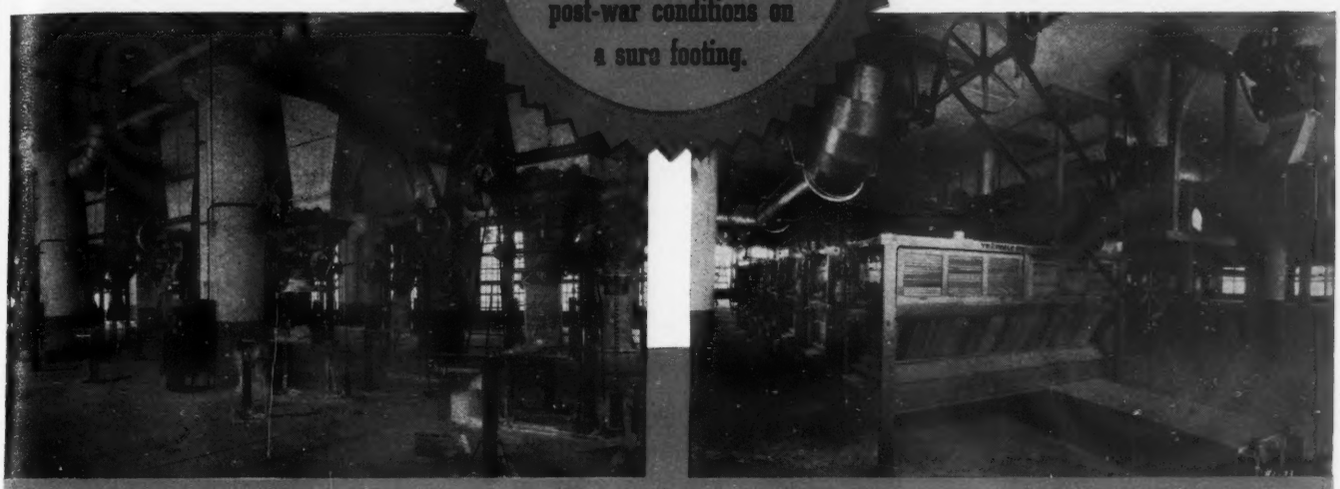
Reel room of starch plant showing Dodge-Timken Line Shaft Hangers.



HELP ASSURE VICTORY

Buy War Bonds. Conserve Rubber. Eliminate Unnecessary Travel. Use the Telephone Only When Important. Salvage All Scrap and Waste Material.

All Timken Bearing production now goes into fighting machines. However, the Timken Bearings in your motor vehicles or industrial machines will see you through the emergency—and beyond it—if you make sure they are lubricated and inspected regularly.

Even partially equipping a machine with Timken Tapered Roller Bearings gives it a considerable advantage—in speed, accuracy and endurance.

But total war demands total production, and one of the best helps in this respect is the use of Timken Bearings at every suitable position in every machine.

Engineers who are doing this are making their services invaluable to their companies because they are producing not only better machines—but also *better selling* machines; for equipment buyers everywhere recognize the trade-mark "TIMKEN" as a sure guide to superiority.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

"All There Is In Bearings"

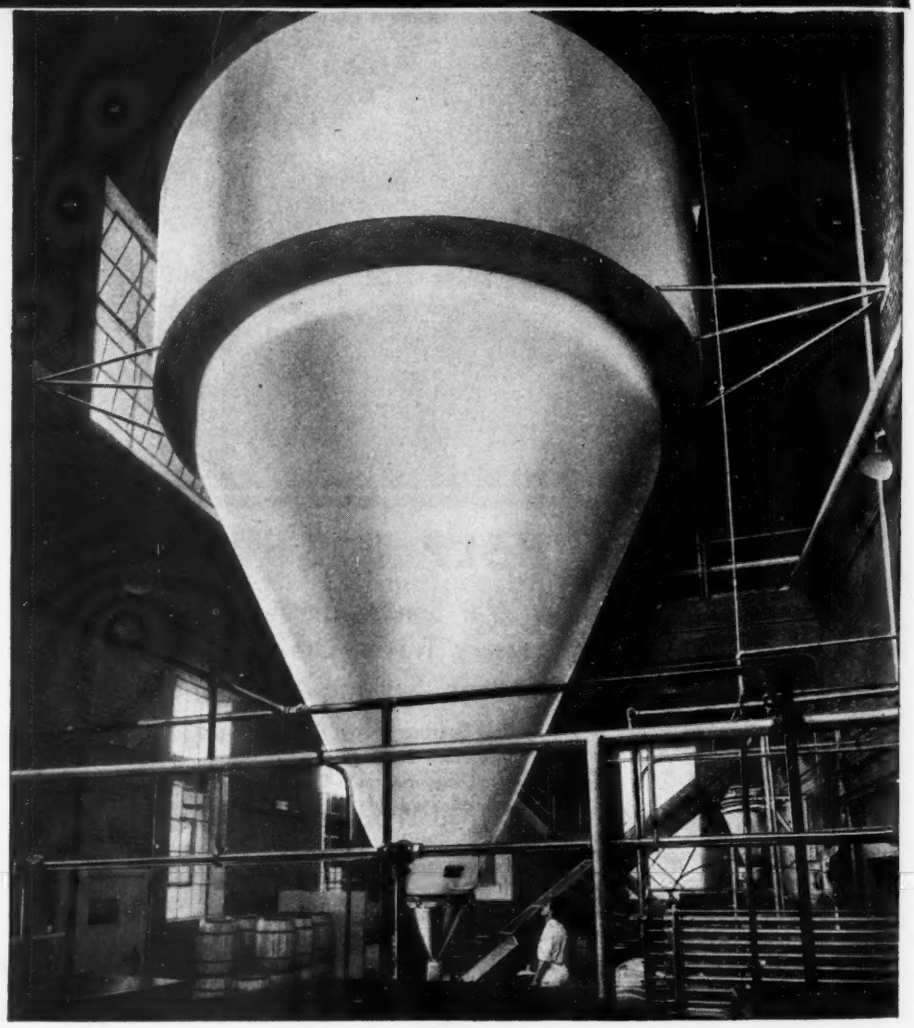
TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

Douthitt Designed Equipment
For Flexible and Exacting Food Dehydration

The GRAY-JENSEN SPRAY PROCESS DRYING PLANT



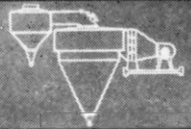
Behind every Gray-Jensen unit and Douthitt Designed fruit and vegetable dehydration unit stands a staff of research scientists, dehydration specialists, skilled construction engineers and operating craftsmen which guarantees satisfactory performance.

Designed for the spray drying of dairy foods, infants' foods, soup mixtures and all other food products and chemicals that can be reduced to liquid form and handled with pumps, the Gray-Jensen Spray Process Drying Plant continues to be the acknowledged leader in the field. The flexibility of this Douthitt designed unit allows for the successful and economical processing and at a lower manufacturing cost per pound of powder.

OVER 175 WORLD WIDE INSTALLATIONS OF DOUTHITT DESIGNED DEHYDRATING PLANTS

*Solubility * Full Recovery of Solids * Flavor Goodness * Keeping Quality * Economical Operation*

Gray-Jensen Spray Process



Drying Plant

The DOUTHITT CORPORATION
CHICAGO, ILLINOIS

AN AMERICAN INSTITUTION WORKING WITH AND FOR AMERICA

U.S. needs US strong

The great task ahead requires individual "all-out" performance from each of us. Every branch of the service, abroad and at home, in our factories, fields, mines and within the home, all of us are affected by the essentials of the national nutrition program. Food, too often in the past taken as a matter of course, now may well be the turning point to Victory. The precious products from our farms and ranches must be protected and conserved to the nth degree lest we weaken our cause. Spoilage, shrinkage and contamination must be held in check through adequate packaging protection. Here at Rhinelander the experience of nearly a half-century devoted to specialization on protective papers is concentrated upon improving the quality and increasing the production of America's essential food wrappings.

Folke Becker

PRESIDENT
RHINELANDER PAPER COMPANY

RHINELANDER
PROTECTIVE PACKAGING
Papers

FROM THE BEST THAT'S MADE TO THE CHEAPEST THAT'S GOOD

Genuine Greaseproof
Coffee Bag Papers
Confectionery Papers
Cereal Wrapping Papers

Laminated Greaseproof Papers
Lard and Shortening Liners
Bakery Product Wraps
Coated Food Packaging Papers

Cracker Box Liners
Greaseproof Innerwraps
Glassine Papers, Plain,
Colored & Embossed

Wax Laminated Glassine
Opaque Label & Bag Glassine
Packing Industry Wrappings—
and Specialties to order

RHINELANDER PAPER COMPANY • MILLS AT RHINELANDER, WISCONSIN, U.S.A.

To Owners of

G-E Air Conditioning

G-E Refrigeration

The G-E air conditioning and commercial refrigeration installation that has served you so well these past years has taken on added value with the impact of war.

*

In the first place, your installation is irreplaceable; new equipment for peacetime needs is no longer available. Furthermore, replacement parts and servicing facilities are not so easy to obtain as in normal times.

*

Doesn't it behoove you, then, to protect your investment in G-E air conditioning and commercial refrigeration equipment? Should you not do everything you can to maintain that equipment so that it will continue to serve you efficiently and economically?

*

Of course. It's just plain horse sense. And here are some of the things that you can do.

*

Keep your equipment clean. Dust and dirt, if allowed to accumulate, can greatly accelerate the rate of wear of moving parts, thus contributing to premature breakdowns.

*

Keep motors properly oiled. Burned out bearings can easily result if you fail to follow oiling instructions given for your equipment.

*

Inspect belts for tension and alignment. Needless wear of precious rubber can be prevented by simple wrench adjustments of belt tension and pulley alignment.

*

These are jobs that you — or your maintenance staff — can readily attend to . . . jobs that will pay you dividends in *forestalling* the need for service and in prolonging the life of your equipment.

*

General Electric Company, Air Conditioning and Commercial Refrigeration Department, Division 3891, Bloomfield, New Jersey.

GENERAL ELECTRIC

AIR CONDITIONING...COMMERCIAL REFRIGERATION...WATER COOLERS

DRY PACKAGING FOR A DAMP HELL!

Heat . . . sweat . . . rain! A ceaseless downpour turns the winding trail into a quagmire along which native carriers slog with their loads. On either side the jungle's rotting undergrowth soaks up the rain, and the heat turns it into a heavy, fetid vapor. *In all this world is one last thing dry?*

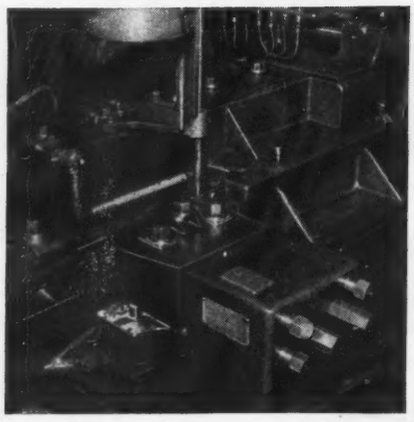
Yes! In those loads the natives carry are small but vital packages that mean comfort and health to our jungle fighting men: salt tablets — toilet paper — sutures — sulpha-drugs — dehydrated foods — every item snug and dry.

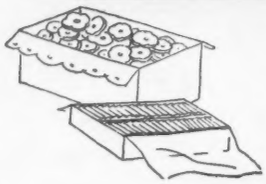
These small packaged products are dry and uncontaminated because the Quartermaster Corps of the United States Army foresaw the need for strong, light-weight, *moisture-proof* packaging, and because such organizations as U. S. Envelope Company had the facilities and the "know-how" to quickly manufacture such heat-sealing and moisture-proof packages. In war, as in peace, these facilities are available immediately and always. What is your problem?

U·S·E *protective packaging*

UNITED STATES ENVELOPE COMPANY ☆ CONTAINER DIVISION ☆ SPRINGFIELD, MASSACHUSETTS

better Methods with special machines





A Baldwin-Duckworth special *machine that* rolls *tenons with greater accuracy than a screw machine operation.*

American machine designers are famous for standardized machines and standard tools. The many and amazing special machines they produce are known to few. These are often used only in the designer's own plant. We have a number of them. They are sure "stoppers" wherever machine designers or factory production superintendents visit our plants.

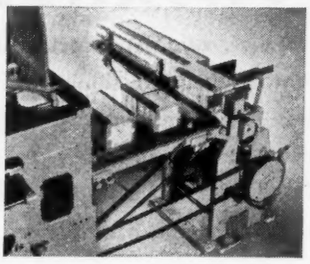
One of them is a tenon rolling machine. Fair equivalents of the operations it performs could be produced on standard screw machines. Instead of cutting tenons for small diameter pins for some of our chain belts, this special machine rolls them to give uniform concentric circumferences. Tolerances are unfailingly close—a basic essential for the quiet efficiency and long life of Baldwin roller chain belts.

Better DRIVES with Baldwin Roller Chain Belts

"Their split-second timing—their positive drive that maintains a constant speed ratio—are important factors in the design of many machines in the food industry. Always remember this point when designing or replacing drives: *roller chain belts are the only type of transmission that can absorb shock loading without loss of speed ratios or efficiency.*"

Your Baldwin catalog is a roller chain belt encyclopedia, but for specialized applications of chain belts for the transmission of power or conveying of materials, also consult a Baldwin man. Baldwin-Duckworth Division of Chain Belt Company, 325 Plainfield St., Springfield, Mass.

EXAMPLE



This packaging and wrapping machine has:

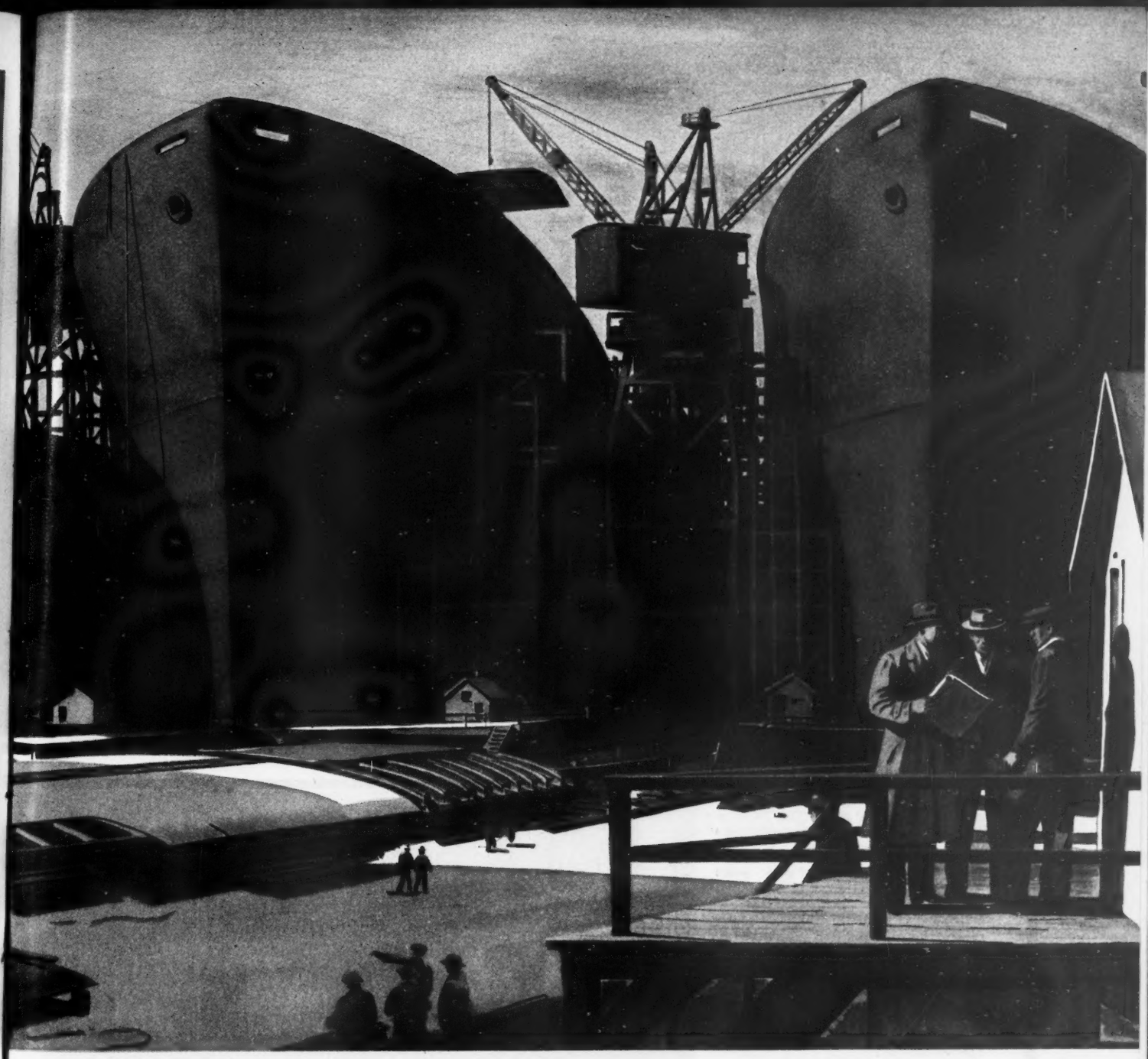
1. A quiet, positive, slip-free drive.
2. Continuous, jerk-free smoothness of operation.
3. Unfailing split-second timing in its operation.

IT'S BALDWIN-EQUIPPED

Better Drives Through Better Methods!

BALDWIN

ROLLER CHAIN BELTS



American industry demonstrates that private enterprise can do the job better, faster. Launching ships in 4 days and 15 hours, and 3 days and 8 hours, is the remarkable achievement of America's great shipbuilding industry. Howell Electric Motors play a vital role in the production as well as in the operation of many of these ships.

Howell Motors help build our ships— They also serve at sea

In the shipbuilding industry as in the automotive and many other industries, Howell Electric Motors are playing an important part . . . In the shipyards—on vital machine tools and other special equipment—Howells are used extensively.

Many of our newest and finest ships are going to sea equipped with Howell Electric Motors — on the winches, pumps, elevators, heating and ventilating systems.

The men and women who build and distribute Howell Motors are proud of their war production record. Proud to be turning out the precision-built motors that are going into vital war work, helping build ships, planes, tanks and trucks. Proud to be working in the defense of American ideals, principles and objectives.

HOWELL ELECTRIC MOTORS COMPANY, HOWELL, MICHIGAN
Manufacturers of Quality Motors Since 1915

The **HOWELL IDEA**
in Electric Motors
precision-built

What an extra set of carbon rings taught a food processor about wartime protection of food quality (an actual case)

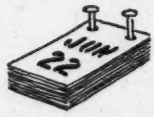
The "Spares" Stayed on the Shelf

June 1, 1939—

—needing oil-free air to protect his product, a manufacturer purchased a Gardner-Denver "CRX" Carbon Ring Compressor on this date. Just to be on the safe side, he ordered a spare set of carbon rings.

The Years Go On—

—and the spares stayed on the shelf while the Carbon Ring Compressor operated seven hours per day, seven days every week. The original set of rings continued in faithful service—keeping all oil out of the air.

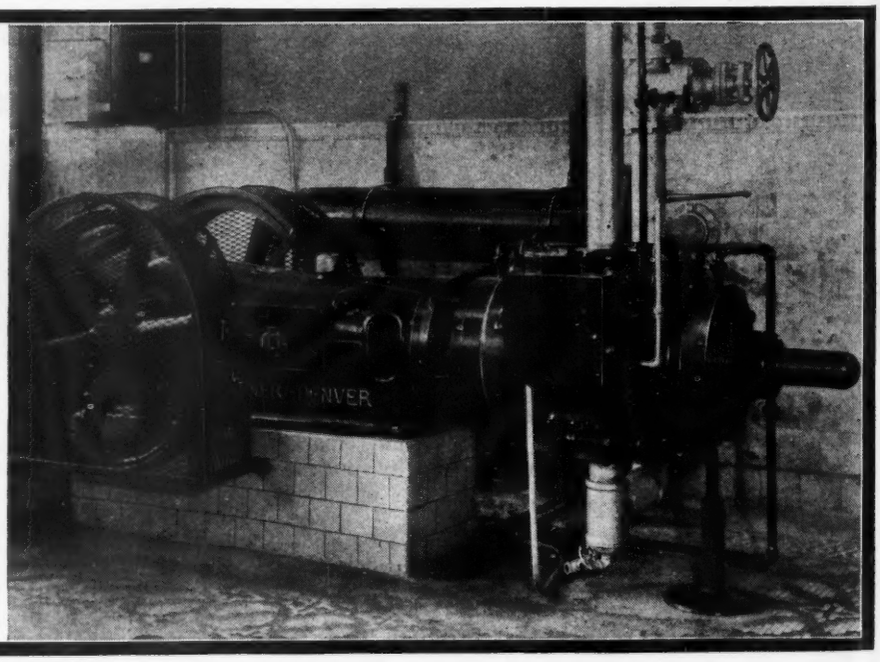


June 22, 1942—

Only now—three years after the compressor was installed, did the manufacturer put the "spares" in use. Now the Carbon Ring Compressor is again set for years of protective service—guarding food quality for the duration.

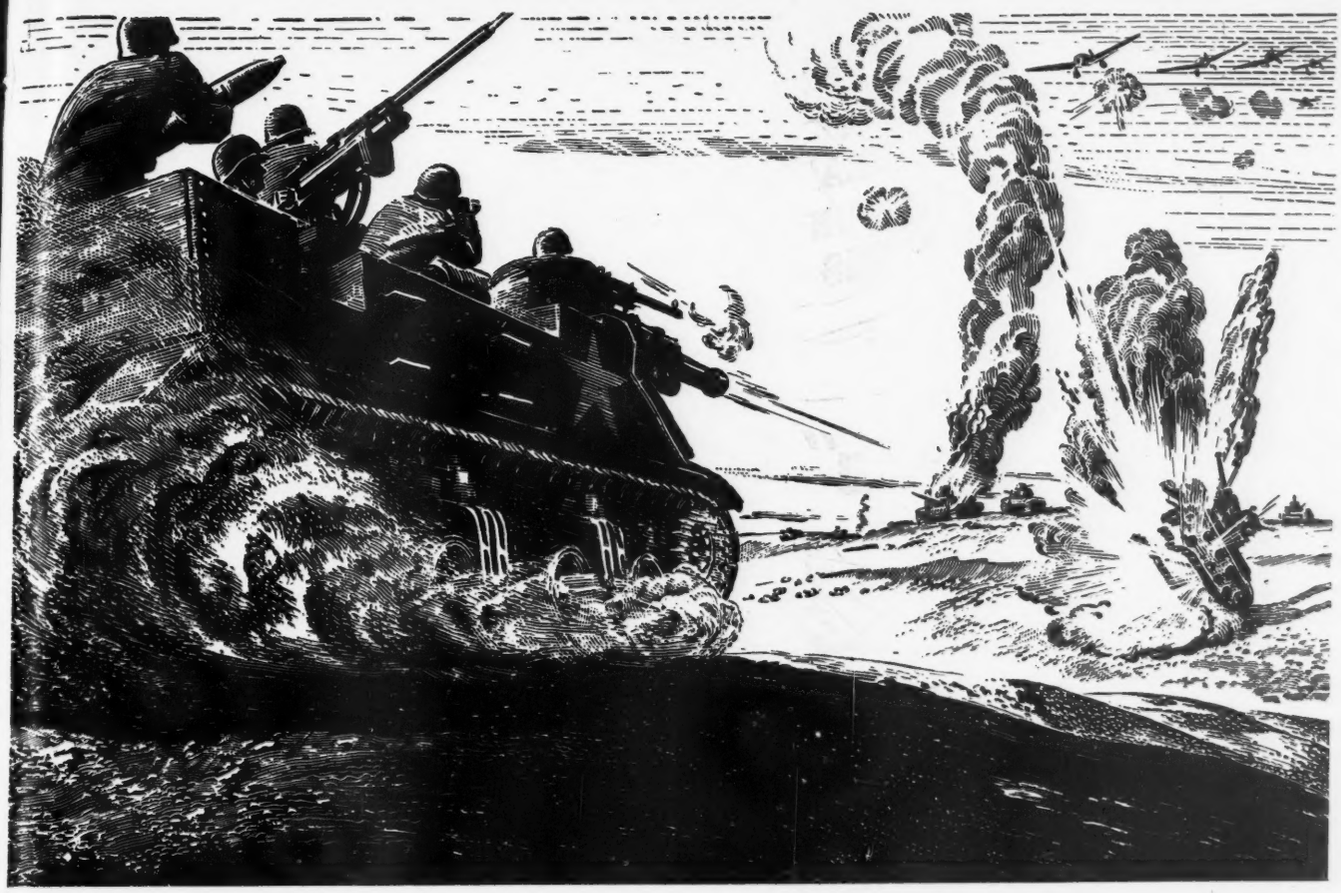
Here are the extra features that enable these "CRX" Compressors to assure an air supply that's free from oil for year after year:

1. Carbon rings that bear on cylinder walls require no lubricant—no oil, water or glycerine to contaminate the air.
2. There is no metallic contact between piston and piston bore, because weight of piston is carried by piston rod and special tail rod.
3. Special distance piece between cylinder and frame prevents entrance, into cylinder, of that part of piston rod working in power end.
4. Special metallic wiper prevents oil being carried along the piston rod from the crankcase.



Write for an illustrated bulletin giving the full specifications
Gardner-Denver Company, Quincy, Illinois

GARDNER-DENVER *Since 1859*



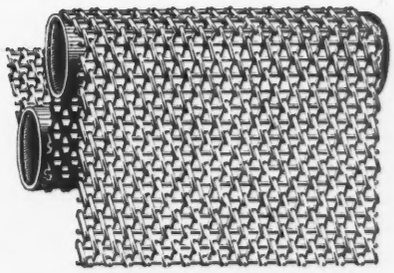
for Anti-tank shells . . . or dehydrating foods

That tank-busting shell was hardened on a Wissco *Metal* Conveyor Belt. These modern conveyor belts are now speeding up heat treating and processing of both military and civilian goods.

Wissco Conveyor Belts are proving a new "find" for more and more industries. Typical wartime applications are hardening of projectiles and annealing shell cases; brazing; canning food; dehydration; rubber reclaiming, and tin salvaging.

Each Wissco belt is custom-engineered and manufactured to meet the requirements of a specific job, high or low temperature, chemical, abrasive or other kind of punishment. Back of each are 45 years of Wissco pioneering and accumulated experience.

Write for free book, "Wissco Metal Conveyor Belts." Wickwire Spencer Steel Co., 500 Fifth Avenue, New York, or Buffalo, Chicago, Worcester, San Francisco.



FLEXIBILITY? Wissco Conveyor Belt construction permits operation over small diameter pulleys, insuring extreme flexibility and economy in design.

WHERE THEY ARE BEING USED

Annealing Ovens	Dehydrating Food
Hardening Furnaces	Canning Operations
Brazing Furnaces	Chemical Processing
Degreasing	Decorating Glass, Ceramics
Reclaiming Tin, Rubber, etc.	

★ WISSCO ★

CONVEYOR BELTS FOR EVERY PURPOSE

. . . Defeat comes to a *Mosquito*

IN the tropics and subtropics—in the Solomons and New Guinea, in Africa, India and China—the anopheles mosquito has long waged a successful war against man with its malaria-jabbing bayonet. Quinine has been used to fight off the disease, but this natural drug was lost to the United Nations early this year through Japanese conquest of the Dutch East Indies, source of 95 per cent of the world's quinine supply.

Our fighting men in these far-flung battle zones are nevertheless receiving full and effective protection against the infectious disease which anopheles transmits; for the United States Government now has huge quantities of a man-made antimalarial drug known as Atabrine.*

Today, Atabrine is being manufactured in the United States alone at a rate sufficient to treat 53,000,000 cases of malaria per year; whereas the entire world supply of quinine hitherto available for malaria provided medication for an estimated 50,000,000 patients annually. And the United States Government pays only 6¼ cents for the Atabrine required to treat a patient, or about as much as you pay Uncle Sam to post an airmail letter.

Back of this record is a story of research and production which starts with the outbreak of war in 1939. At that time Winthrop Chemical Company initiated research to free this country from dependence on foreign sources for the intermediate products needed in manufacturing this antimalarial. Processes had to be developed for transforming available domestic raw materials into the necessary intermediates, and complicated chemical steps devised for carrying out the synthesis of Atabrine on a commercial scale.

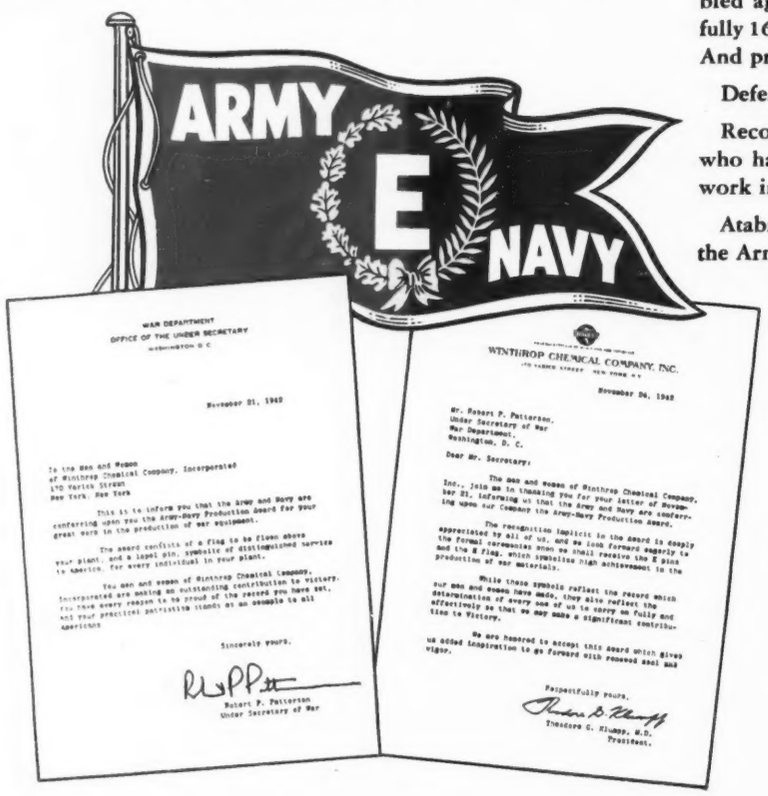
Fourteen months before Pearl Harbor Winthrop produced the first Atabrine entirely of domestic origin. Since then production schedules have been doubled and redoubled and doubled again, so that today the rate of American production is fully 16,000 per cent above this country's pre-war requirements. And production schedules are still being revised upward!

Defeat *has* come to the mosquito!

Recognition has come to the men and women of Winthrop who have been awarded the coveted Army-Navy E for "great work in the production of war equipment."

Atabrine is just one of the many vital drugs produced for the Armed Forces.

** Atabrine is Winthrop's registered trademark for quinacrine hydrochloride.*


ARMY
E
NAVY
WAR DEPARTMENT
OFFICE OF THE UNDER SECRETARY
WASHINGTON D C
November 21, 1942
To the Men and Women
of Winthrop Chemical Company, Incorporated
170 Varick Street
New York, New York
This is to inform you that the Army and Navy are conferring upon you the Army-Navy Production Award for your great work in the production of war equipment.
The award consists of a flag to be flown above your plant, and a lapel pin, symbolic of distinguished service to America, for every individual in your plant.
You men and women of Winthrop Chemical Company, Incorporated are making an outstanding contribution to victory. You have every reason to be proud of the record you have set, and your practical patriotism stands as an example to all Americans.
Sincerely yours,
Robert P. Patterson
Under Secretary of War
WINTHROP CHEMICAL COMPANY, INC.
170 VARICK STREET NEW YORK, N.Y.
November 24, 1942
Mr. Robert P. Patterson,
Under Secretary of War
War Department,
Washington, D. C.
Dear Mr. Secretary:
The men and women of Winthrop Chemical Company, Inc., join me in thanking you for your letter of November 21, informing us that the Army and Navy are conferring upon our Company the Army-Navy Production Award.
The recognition implicit in the award is deeply appreciated by all of us, and we look forward eagerly to the formal ceremonies when we shall receive the E pins and the E Flag, which symbolize high achievement in the production of war materials.
While these symbols reflect the record which our men and women have made, they also reflect the determination of every one of us to carry on fully and effectively so that we may make a significant contribution to Victory.
We are honored to accept this Award which gives us added inspiration to go forward with renewed zeal and vigor.
Respectfully yours,
Theodore C. Klumpp, M.D.
President.

Winthrop

Chemical Company, Inc.

Pharmaceuticals of merit for the physician

New York, N. Y. Windsor, Ont.

WINTHROP

... a name to remember in the ENRICHMENT FIELD!

WINTHROP is a name which has been closely identified with the enrichment movement since its beginning.

With the early introduction of "CRYSTALLINE B_1 WINTHROP," crystalline thiamine hydrochloride, U. S. P., to help you take advantage of growing consumer interest in the vitamin values of foods, this company initiated a series of valuable contributions in the food field.

Then, by offering "B-E-T-S"—tablets to be dissolved in water and added at the sponge or dough stage to increase vitamin B_1, niacin and iron to recommended potency levels in the baked loaf—and recently with "*VEXTRAM*" to raise the levels of the same three nutrients in flour, WINTHROP provided bakers and millers with *two* safe, practical methods of enrichment. *Both* combine easy, accurate and *dependable* use with extreme economy.

The successful record of these and related products, makes WINTHROP a name to remember in the enrichment field.

Consult our TECHNICAL SALES SERVICE for help with your enrichment problems. Stocks are ready at New York, Chicago, Denver, San Francisco, Dallas and Atlanta, for prompt delivery. For latest, low prices and a *free* copy of the informative booklet, "*Quick Facts about Enriched Bread*," write TODAY.

WINTHROP MATERIALS FOR FOOD-PRODUCERS:

"CRYSTALLINE B_1 WINTHROP"
"CRYSTALLINE VITAMIN C"
"B-E-T-S"
"VEXTRAM"
NIACIN
CALCIUM PANTOTHENATE
VITAMIN B_2 VITAMIN B_6
NIACINAMIDE

WINTHROP

ADDRESS INQUIRIES TO—

Special Markets Division

WINTHROP CHEMICAL COMPANY, INC.

170 VARICK STREET, NEW YORK, N. Y.

ST. REGIS MULTIWALL PAPER BAGS

TOUGH AND STRONG...
THEY DELIVER THE GOODS

More than 300 products are now being packed successfully in St. Regis Multiwall Paper Bags. Many food manufacturers, faced with shortages of *critical* packaging materials, are turning to *non*-critical kraft paper bags.

Some idea of the versatility of custom-made St. Regis Paper Bags can be gained when you realize that they are being used: (1) to resist moisture vapor penetration; (2) to resist oil penetration, (cocoanut meat, etc.); (3) to package wet products (potatoes, etc.); (4) to prevent sifting of finely ground products; (5) to resist the elements, rot, mildew; (6) to prevent infestation; (7) to resist exceptionally rough handling (overseas shipments); (8) to resist chemical action of contents.

If you ship in units of 25 to 100 lbs., we may be able to solve your container problem. Your inquiry will receive prompt, expert attention.

Multiwall Bags give 100% protection because 3 or more sheets of tough kraft paper, supplemented by special laminated sheets where necessary, are placed together to make rugged, *sanitary* containers. More than 40,000,000 one hundred lb. bags used for sugar alone, in first nine months of '42.

MULTIPLY PROTECTION . MULTIPLY SALEABILITY

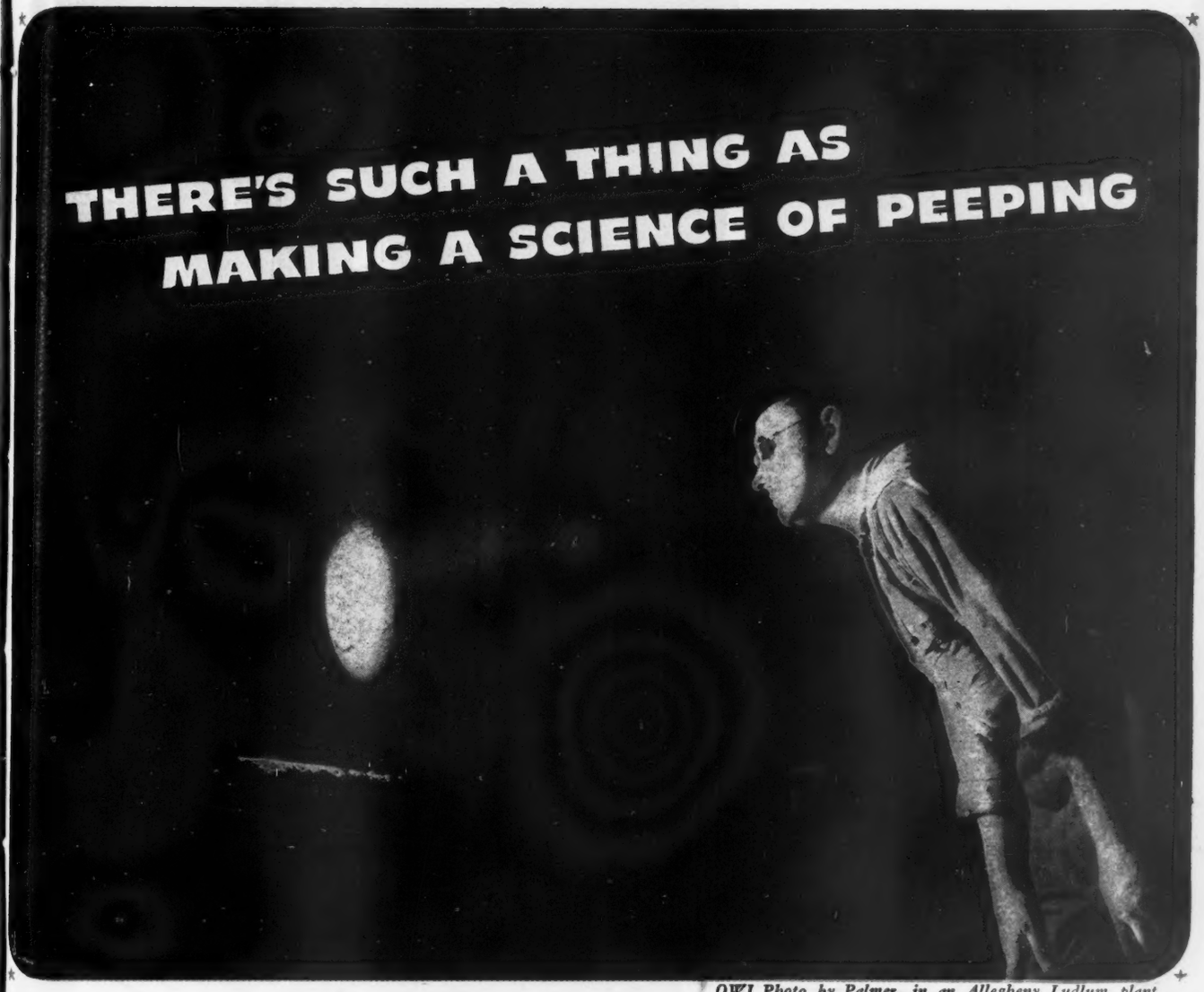
ST. REGIS PAPER COMPANY

TAGGART CORPORATION • THE VALVE BAG COMPANY

NEW YORK: 230 Park Avenue
CHICAGO: 230 No. Michigan Avenue

Offices also at:
Baltimore, Md. Birmingham, Ala. Dallas, Tex. Denver, Colo. Franklin, Va. Los Angeles, Calif. Nazareth, Pa. New Orleans, La. San Francisco, Calif. Seattle, Wash. Toledo, Ohio

THERE'S SUCH A THING AS MAKING A SCIENCE OF PEEPING



OWI Photo by Palmer, in an Allegheny Ludlum plant

★ With this melter, studying the action of some 35 tons of alloy steel in an Allegheny Ludlum electric furnace, peeping is a science. He can determine whether adjustments to the electric power are needed to progress the melt at the proper pace; or whether additional slagging material must be added to prevent too rapid oxidation and consequent loss of critical alloys. His is one of the earliest in a long series of precise operations which brings a batch of Allegheny Stainless to its final wrought or cast form, rigidly true to specifications.

Stainless steel has often been called a "precious" metal. At no time has the term been more true than now. It is more than important, it is imperative that every pound of stainless be selected wisely and used well. It must be used to make the maximum amount of processing equipment and parts with the least possible loss in rejects or spoilage. Even the use of high alloys, where a lower alloyed steel would suffice, is a form of waste. ● Let us help you to conserve the nation's supply of vital alloys; especially if the use of stainless steel itself, or the type of equipment you are building, are comparatively unfamiliar to you. Fabrication data, and the personal assistance of our Technical Staff, are yours on request.

Address Dept. FI

Allegheny Ludlum
STEEL CORPORATION
GENERAL OFFICES:
BRACKENRIDGE, PENNSYLVANIA

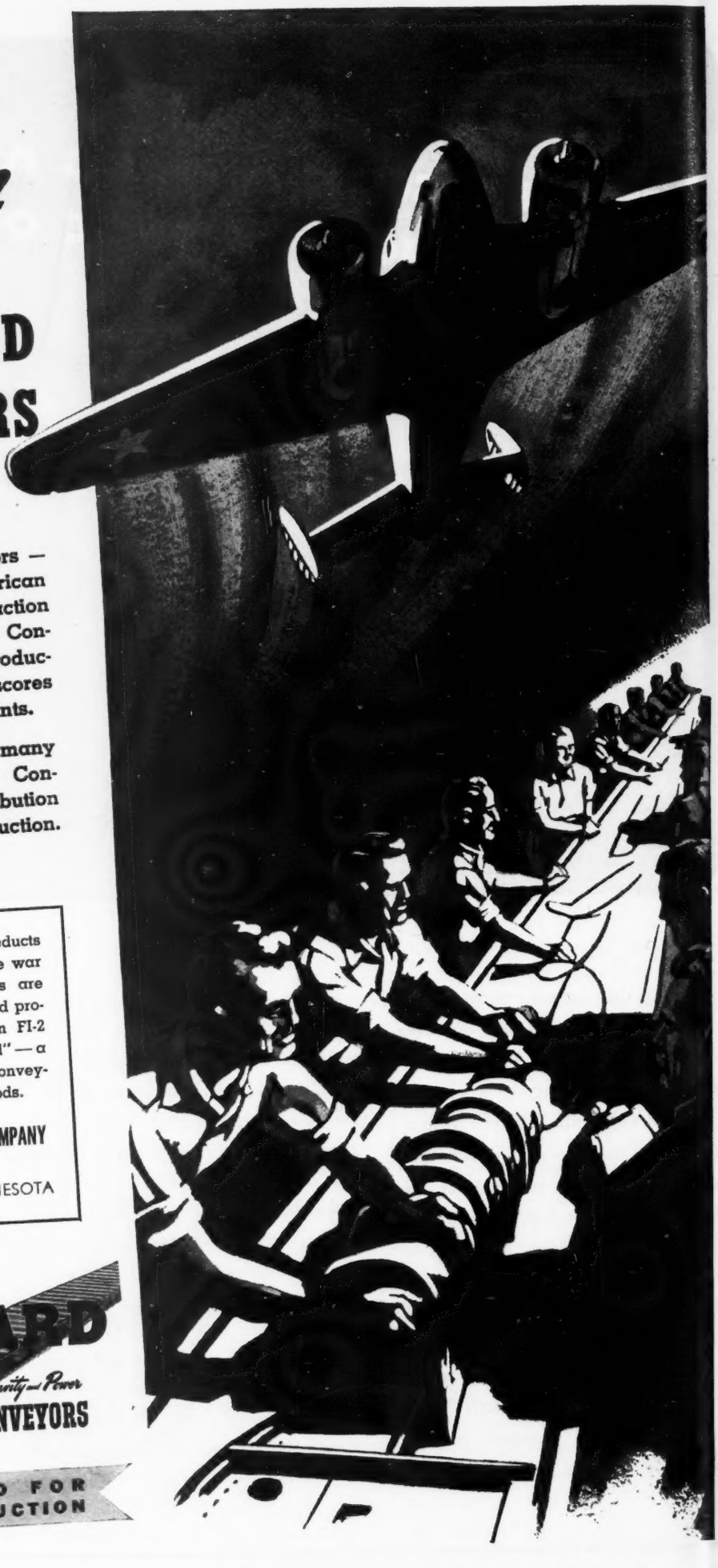
A-8589 . . . W & D

INTO THE AIR . . .

Faster

BECAUSE OF

STANDARD CONVEYORS



BOMBERS and fighters — death-dealing American war birds — get into action faster because Standard Conveyors help to speed production of units and parts in scores of America's aircraft plants.

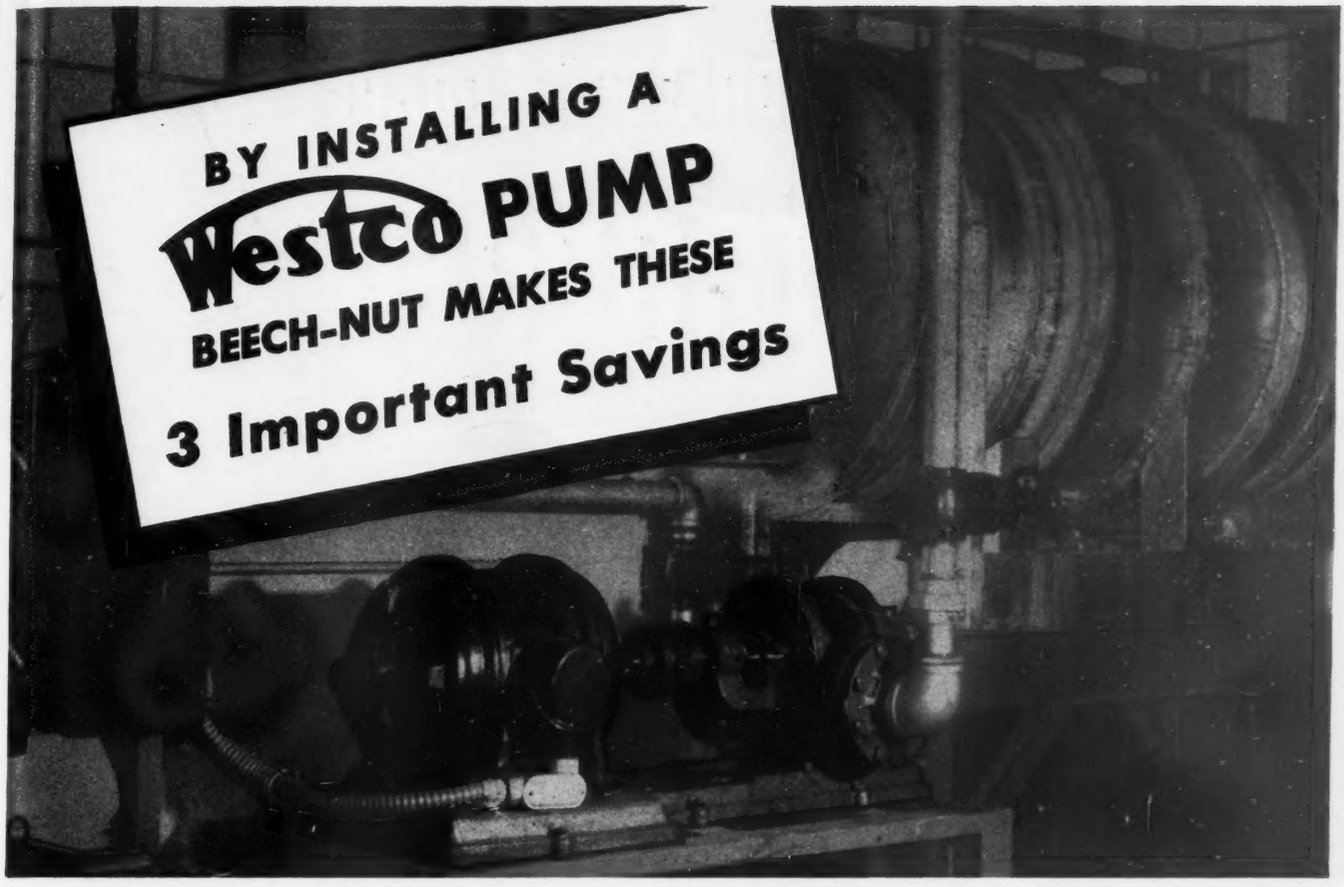
This is another of many examples of Standard Conveyors' important contribution to high-speed war production.

* * *

If you are producing products considered necessary to the war effort, Standard Conveyors are available to help you speed production. Write for bulletin FI-2 "Conveyors by Standard" — a valuable handbook on conveyors and conveying methods.

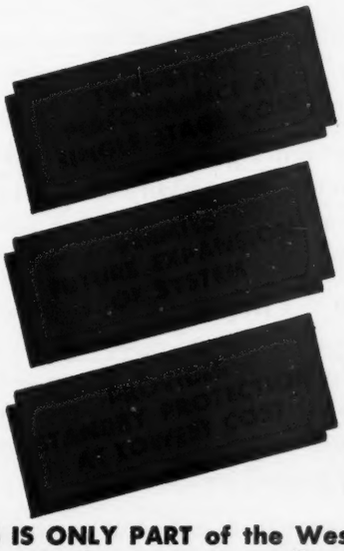
STANDARD CONVEYOR COMPANY
General Office.
NORTH ST. PAUL, MINNESOTA

ENGINEERED FOR FASTER PRODUCTION



In the Beech-Nut Dehydration Plant described in the editorial pages of this issue the vegetables pass through a flame peeler and then enter a washer. Here the charred skins are quickly and cleanly removed by jets of water sprayed at high pressure... *water pumped to this pressure by the WESTCO Pump shown above!* This pump is in continuous operation fifteen hours a day and Beech-Nut reports "We have had good performance to date at pressures as high as 150 pounds."

Beech-Nut chose a *Westco* for this critical pumping job because it gave vitally important advantages no other pump could match...



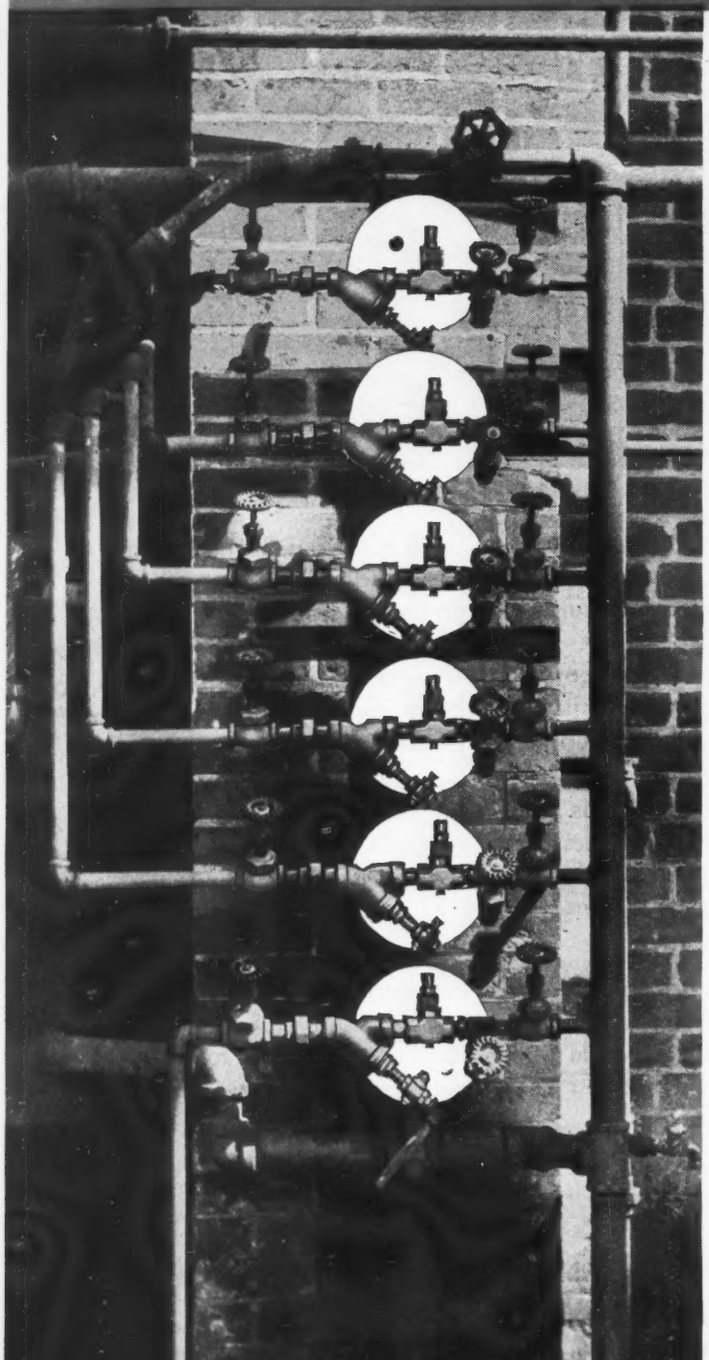
Because of its unique turbine design, this *single-stage* Westco Pump, operating at 1750 r.p.m., *continuously* supplies the high operating pressures required. A centrifugal type pump would require at least two stages to do the same job. *Thus, the Westco saves on first cost... saves on operating costs... saves on maintenance!*

Due to the operating characteristics of the Westco Turbine, additional spray nozzles may be added to the washer as required with *decreasing* horsepower requirements, whereas a centrifugal would require *additional* horsepower to handle added jets, thus increasing the cost of expanding the system, as well as increasing the cost of operating it.

Westco Pumps have *renewable* liners. By simply replacing these liners, the entire pump can be quickly and economically renewed. So, merely by keeping an extra liner assembly handy, Beech-Nut obtains safe standby protection at a *fraction* of the cost of a complete separate pump assembly!

THIS IS ONLY PART of the Westco story of peak performance efficiency at unusually low installation and operating costs. Regardless of your food processing application, get the full details on these *renewable liner* pumps from your nearby Westco dealer. Or write direct!

World's Largest Cotton-Seed Cooker is YARWAY TRAPPED



Cool condensate, flowing from control chamber K through center of valve F, reduces chamber pressure and valve lifts. Hot condensate vaporizes in control chamber, raising chamber pressure and closing valve.

SIX YARWAY Impulse Traps and Strainers handle the big job of draining the heating coils of this six-high continuous cooker—largest ever built—at Magnolia Provision Co., Houston, Texas.

Ideally suited to the service—providing *continuous discharge on heavy condensate loads,* during heating-up periods, and *intermittent operation on light loads*—Yarway Traps answered this manufacturer's problem, completely.

Not only for *quicker heating* and *greater sustained heating efficiency;* but for many other distinct advantages—Yarway Traps are replacing less efficient, less dependable devices in many plants.

Have you investigated this trap about which users say,—*"saves fuel,"*—*"saves space,"*—*"easier and cheaper to install,"*—*"we like its flexibility on different pressures,"*—*"saves maintenance trouble and expense,"*—*"cheaper to replace with Yarways than to repair old-type traps,"* etc., etc.

See your local mill supply distributor or write for Bulletin T-1737.

YARNALL-WARING COMPANY
127 Mermaid Avenue, Philadelphia, Pa.

YARWAY IMPULSE STEAM TRAP

"Speed" says, "I hardly need to remind you, as a leading producer of packaged goods, that glue is great stuff — but you've got to keep it in its place. Why, I've seen Top Sealing Machines so caked up with glue that they looked like some fountain Old Man Winter had caught up with. And the operators were wondering why efficiency was down and spoilage running high.

"Now here's a good practical dose of 'know how' that will help keep your Pneumatic Top Sealers producing at top form:

(1) After the machine is shut down, turn the glue feed pipes to one side, away from the glue rolls, and wash these rolls thoroughly with rag and water.

(2) Those folding rolls are mighty important, too. Wash them the same way so that they are always free to turn.

(3) The flap-support rolls are directly beneath the glue rolls (therefore not visible in the close-up photo here shown) and should likewise be carefully washed.

(4) The flap-folding rails, or folding plates, must also be kept free from caked-up glue.

"Maybe you think this means extra work. Sure it does. But it's just the kind of good horse sense that saves you plenty of breakdowns, spoilage, and lost hours in the long run.

"You find it pays good dividends, don't you, to brush your teeth and wash up before you go to bed? Well, the same reasoning applies to your Top Sealing Machine. Put it to bed right, and you'll have a whole lot smoother operating day — with increased efficiency and greater production. So just try these tested TOP-SEALING tips from your old pal 'SPEED'."

PNEUMATIC SCALE CORPORATION, LTD.

91 Newport Avenue, North Quincy, Mass.

Branch Offices: NEW YORK • CHICAGO • SAN FRANCISCO

★ PNEUMATIC
SCALE CORPORATION, LTD.
PACKAGING & BOTTLING EQUIPMENT

What temperature can the package stand?

• Full-color photographs are beautifully reproduced on the covers of these Container Corporation cartons made for Snider Packing Corp., Rochester, N. Y.

QUICK-FREEZING processes do things to packaging materials. That's why old packaging rules are no good in this new field. Extreme temperatures, the nature of the product and its distribution, and many other factors have a bearing on package strength, moisture vapor transfer, and the efficiency of the lining or coating.

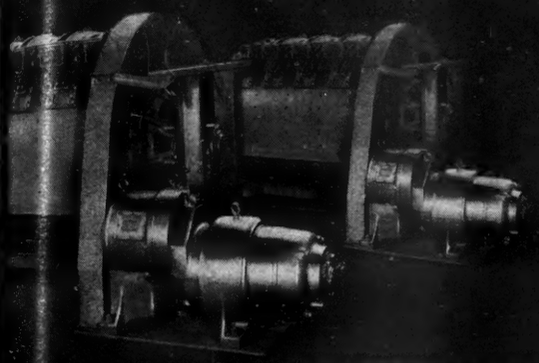
But there are facts you can use in selecting your packages. Our frozen foods staff have been in this new industry almost from its beginning, have contributed much to successful packaging practices . . . and can give you the benefit of their experience. Call or write the nearest Container Corporation office and arrange a consultation.

CONTAINER CORPORATION OF AMERICA

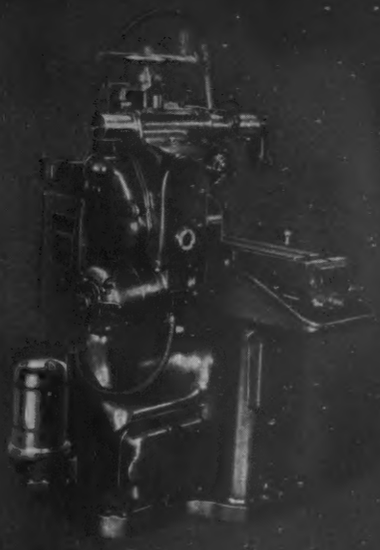
Chicago • New York • Rochester • Natick, Mass. • Philadelphia • Akron • Cincinnati • Cleveland • Circleville • Detroit • Indianapolis
Wabash • Carthage • Anderson, Ind. • Peoria • Rock Island • Minneapolis • Baltimore • St. Louis • Fernandina • Ft. Worth

EVERYTHING PAPERBOARD FOR EVERYTHING PACKED

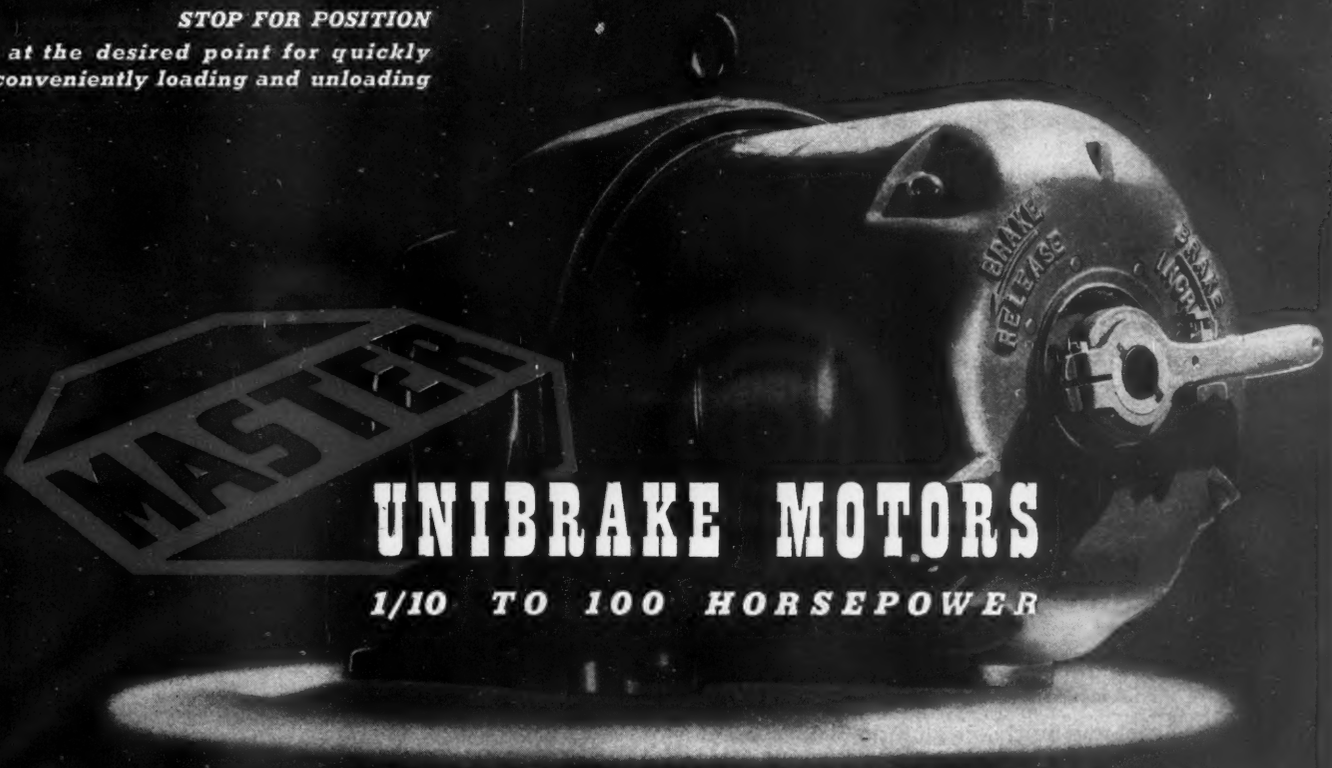
FOLDING CARTONS • BOXBOARDS • CORRUGATED AND SOLID-FIBRE SHIPPING CASES



SPEED UP PRODUCTION
Save time by stopping quickly with a compact integral brake unit



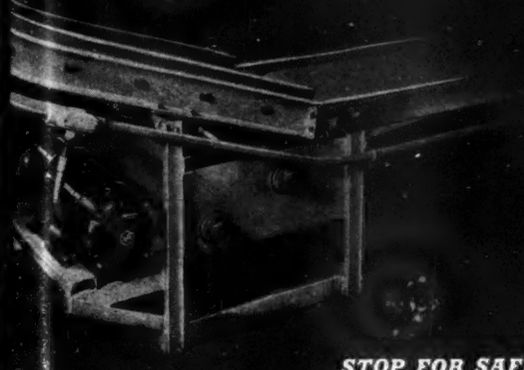
STOP FOR POSITION
Stop at the desired point for quickly and conveniently loading and unloading



UNIBRAKE MOTORS

1/10 TO 100 HORSEPOWER

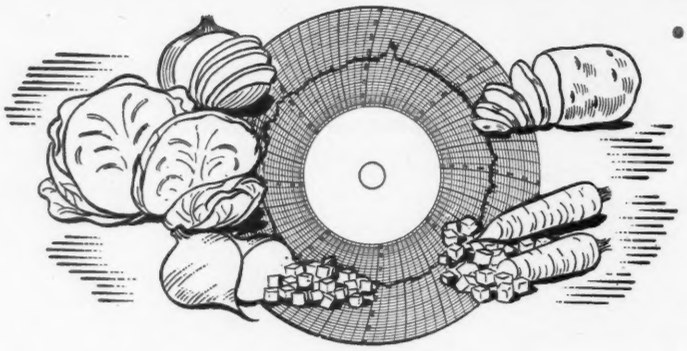
THE MASTER ELECTRIC COMPANY • DAYTON, OHIO



STOP AND HOLD ANY LOAD
Unibrake motors are very advantageous on hoists, elevators, inclined conveyors, etc. . . .

STOP FOR SAFETY
Reduce the hazard of injury to workmen or damage to equipment which might cripple vital production

"YOU CAN'T DEHYDRATE 'EM BY GUESS AND BY GORRY"



Bristol's Automatic Controls Stop Spoilage, Increase Output, Save Fuel — Protect Color, Flavor, Vitamins — Insure Uniform Good Quality of Dehydrated Fruits and Vegetables.

Reports are still in the making, but this much about food dehydration is now clear. In successful, large-scale production, you've got to have the right *heat,* the right *moisture,* the right *air speed,* at the right *time,* for the right *volume* — or else!

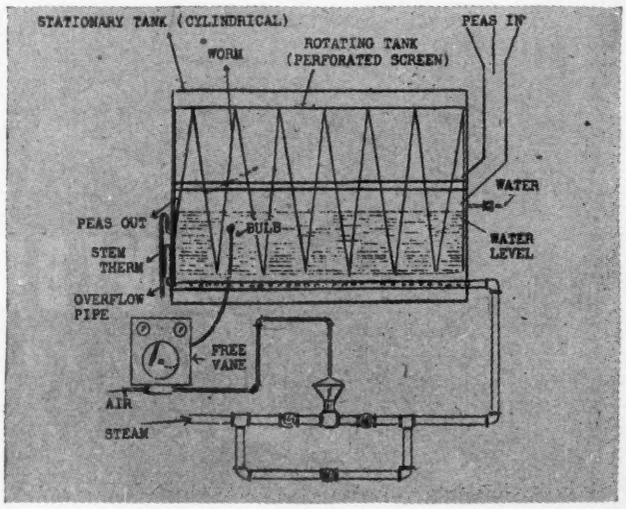
In blanching alone, where volume is apt to vary per batch of product, where steam pressures vary as retorts are put in or out of service, or cooler lines are opened or closed, manual controls are almost certain to spoil a dangerous percentage of war-essential foodstuffs.

Even more so in dehydration proper, where only slight variations from correct temperatures threaten case hardening at the beginning, and scorching or partial destruction of quality at the end, it takes automatic controls to keep best procedures standard.

Whatever your dehydration method, Bristol engineers offer you the benefits of wide, practical experience in applying specific instruments to the control of temperature, relative humidity and air flow in food processes. Alert to dehydration developments, they are ready to place the latest, proven facts and figures at your disposal.

Bristol's Free Vane Temperature Controller on Rotary Blancher Prevents Boiling Over and Spoilage of the Product.

For this vegetable — peas — varying temperatures of 190° to 210°, depending upon batch size and hardness, had to be held from 2 to 10 minutes, in blanching before dehydration. Manual control meant constant watching and produced variations within each set of conditions that caused an overly soft or overly hard cook. Processor was also troubled by boiling over of the blancher. A standard Bristol Free Vane Temperature Controller operating a diaphragm valve in the steam line eliminated these difficulties, reduced spoilage and fuel costs.

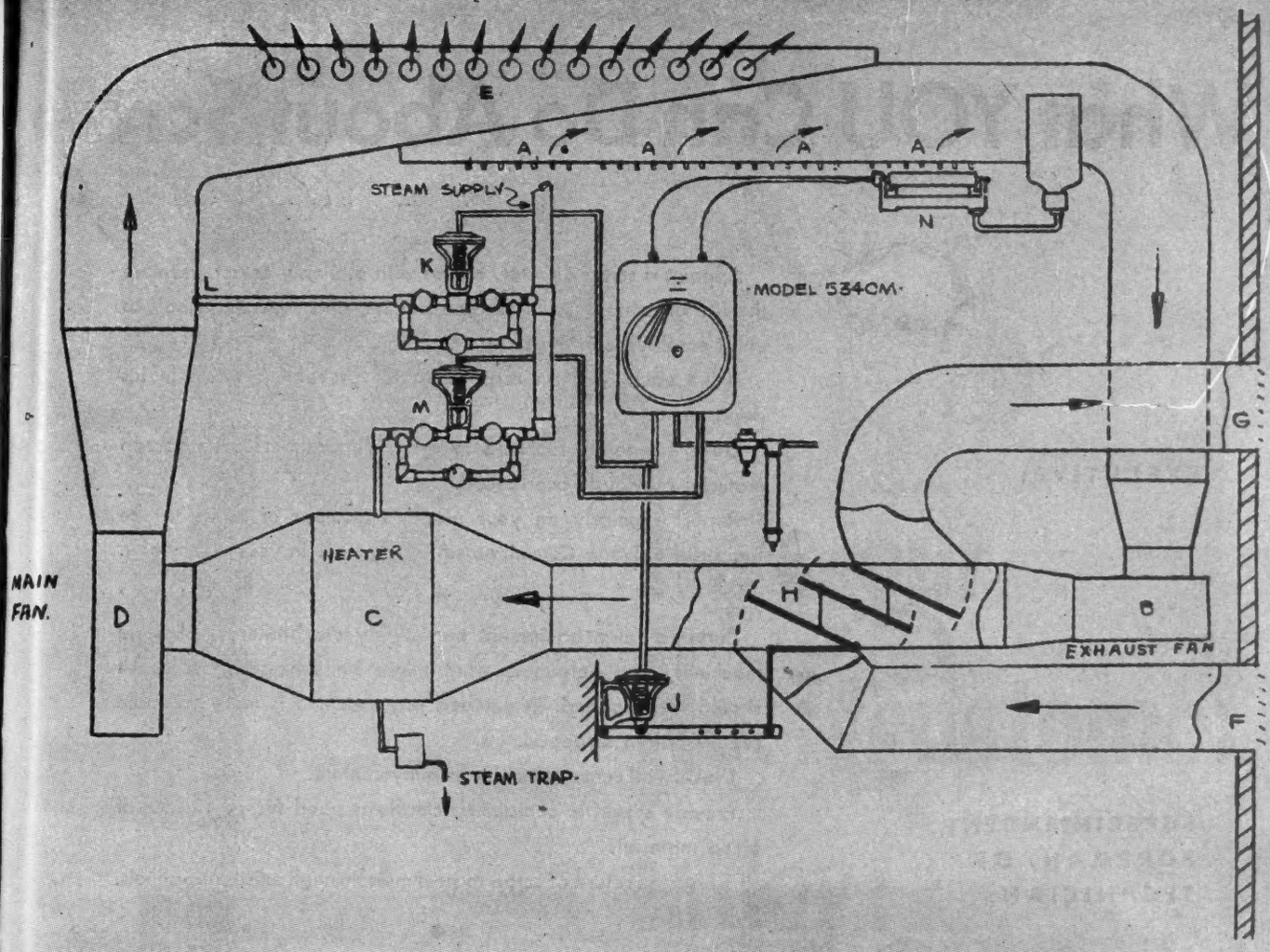


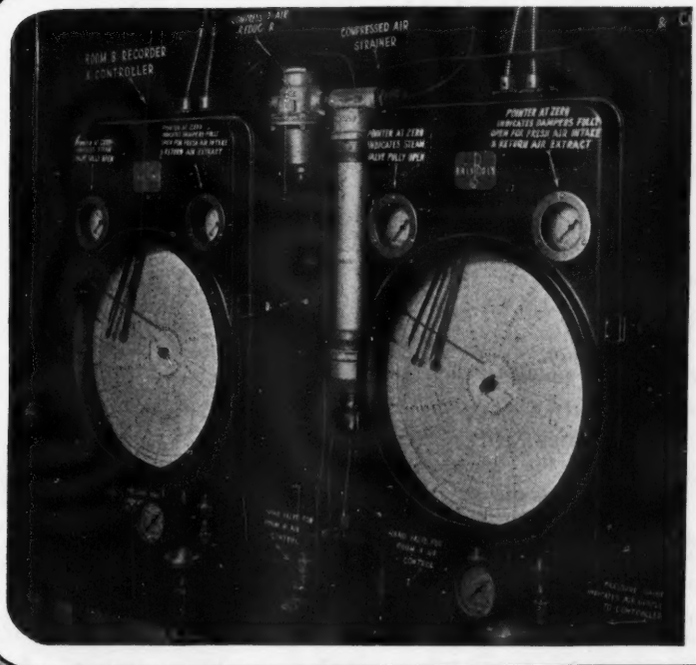
THE BRISTOL COMPANY

Waterbury, Connecticut

The Bristol Co. of Canada, Ltd., Toronto, Ontario

Bristol's Instrument Co., Ltd., London N. W. 10, England





Bristol Installation Cuts Drying Time 50%, Insures Uniform Quality and Rate of Drying in Spite of the Weather

Drying time was reduced from 5 days to 2½ days when Bristol engineers devised complete automatic controls for this delicate dehydration process. Constant watching, constant manual adjustment to changing weather conditions, slowed down operations. Exact low temperatures, exact high humidities, were necessary to avoid case hardening, with gradual reversal of these conditions toward the end of the drying process.

On this process, charted above, Bristol engineers installed a Free Vane Wet & Dry Bulb Psychrometer Controller, recording on a 12" — 24 hr. chart, with Bristol Synchro Valve and Lever Motor for valve and damper control. Write for Bulletins A100. Address the Bristol Company, 115 Bristol Road, Waterbury, Connecticut.

BRISTOL

Engineers Process Control for Better Products and Profits

AUTOMATIC CONTROLLING AND RECORDING INSTRUMENTS

What YOU Can Do About Scrap

EXECUTIVE:

Appoint a scrap director, armed with authority to act. Promote the use of posters, pay-envelope stuffers, and collection goals to enlist employees in the scrap campaign.

Make each foreman responsible for preventing waste in his department.

Enforce monthly rechecks in every department to find scrap material previously overlooked.

Report regularly on your plant's collection of scrap to the Industrial Salvage Committee set up by WPB in your community.

•

SUPERINTENDENT, FOREMAN, OR TECHNICIAN:

Survey all plant equipment, particularly idle, broken, or obsolete machines, and determine what might be salvaged, and what should be scrapped. Remember, any machine is more valuable repaired than scrapped.

Classify all scrap metal by its alloy content.

Provide separate containers, clearly marked for each class of scrap material.

Speed the return of scrap to steel mills through existing channels.

•

WORKMAN:

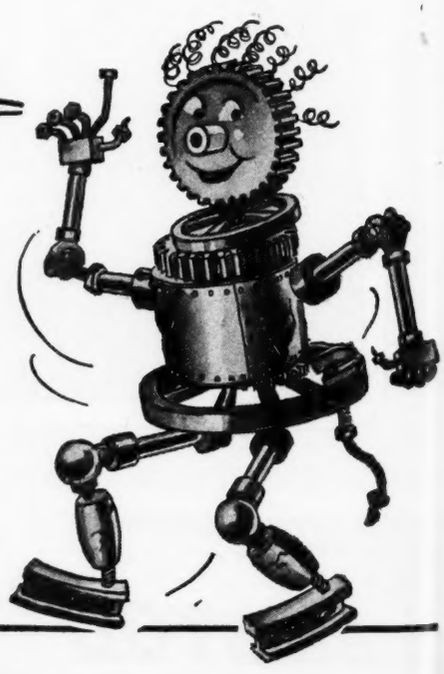
Comb plant and yards for dormant scrap and unusable and abandoned equipment.

Report promptly the equipment which is out of use. If equipment has not been used for some time, and you see no use for it in the near future, transfer it to where it can be used, or scrap it.

Salvage usable parts from equipment marked for scrapping.

SCRAPPY SAYS:

Yes sir, we've got to have scrap. It takes scrap to make steel. And it takes lots of steel to win a war. DO YOUR PART!



ELECTRO METALLURGICAL COMPANY

Unit of Union Carbide and Carbon Corporation

30 East 42nd Street UCC New York, N. Y.

Electromet

Trade Mark

Ferro-Alloys & Metals

He's our No. 1 customer, today!

AND HE'LL CONTINUE TO BE, UNTIL VICTORY!

UNCLE SAM is placing some mighty important orders, today. They're important to all of us. They've got to get the green light. And they're getting it, here at Gardner-Richardson . . . in our research laboratories, in the plants, all up and down the production line.

The war has proved the worth of paperboard and cartons to do a real job, to perform an outstanding service. Paperboard has been ingeniously fashioned and treated to stand up under the most severe conditions—from the hot, humid jungles of New Guinea to the penetrating cold of the Arctic.

Specially developed cartons are helping protect as well as pass the ammunition. They're helping get ordnance parts to the front lines faster, in better condition.

Special cartons for dehydrated foods are multiplying the space in the holds of ships, lightening field packs of our boys on the front lines. And on the home front, paperboard is stepping into the job of many critical metals that have gone to war.

Gardner-Richardson is proud to be a part of an industry that has so many service stripes on its sleeve. We—all of us—will continue to serve and find new ways to serve, until the last shot is fired and Uncle Sam says, "The job is done."

The GARDNER-RICHARDSON Co.

Manufacturers of Folding Cartons and Boxboard

MIDDLETOWN, OHIO

GARDNER-RICHARDSON — FROM PULP TO FINISHED PRODUCT — ENGINEERED PRECISION

Sales Representatives in Principal Cities: PHILADELPHIA • CLEVELAND • CHICAGO • ST. LOUIS • NEW YORK • BOSTON • PITTSBURGH • DETROIT

Chemical and physical laboratories manned by graduate metallurgists, are basic to the exact control of production of Globe Stainless Tubes.
GLOBE Stainless STEEL TUBES

. . *Advancing* GLOBAL-WAR *Achievements*

FOR THE PROCESSING INDUSTRIES! . . . .

☆ CONTROL OF QUALITY is not an "emergency" measure for GLOBE STAINLESS STEEL TUBES . . . nor is it a "conversion" policy for the duration. Control of quality at GLOBE is a basic rule that has guided the development and production of steel tubes for more than 30 years. ☆ It is a company "habit," backed by the modern 37-acre GLOBE mills, scientific laboratories and finest of facilities, which has advanced results for the processing industries throughout peacetime and wartime by assuring tubes of superior resistance to corrosion . . . accuracy in size and gauge . . . diameter and concentricity . . . ductility . . . greater tensile strength and bursting-resistance . . . faster fabrication, easier bending, cutting, welding, expanding or flanging. ☆ GLOBE control of QUALITY has helped the processing industries, and manufacturers of equipment for these industries, to meet many "miracle" schedules in war-production demands, at low costs!

* *Consult GLOBE engineers regarding new applications and selection of the right characteristics of stainless tubes for your specific needs.*

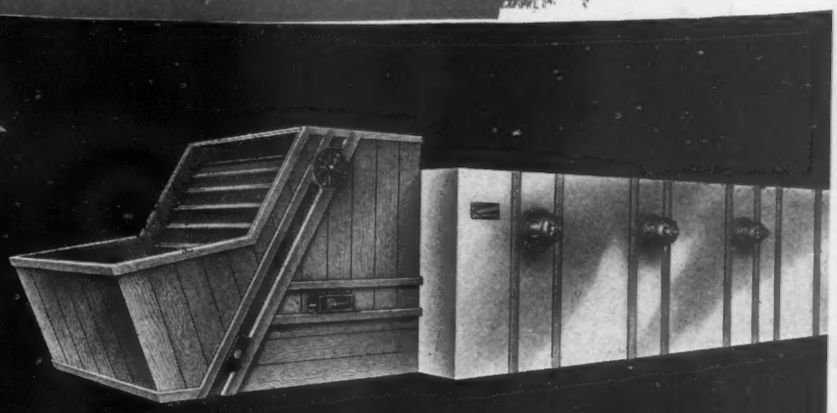
GLOBE TUBES

★ STAINLESS TUBES
★ BOILER TUBES
★ GLOBEIRON TUBING
★ GLOWELD TUBES
★ CONDENSER AND HEAT EXCHANGER TUBES
★ MECHANICAL TUBING

GLOBE STEEL *Tubes*

GLOBE STEEL TUBES CO., *Milwaukee, Wisconsin, U.S.A.*

FOOD DEHYDRATION - UNIFORM QUALITY - LOW COST



THE *New Design* PROCTOR FOOD DEHYDRATOR

1. Entirely automatic in operation.
2. Continuous flow of food products through dehydrator.
3. Flexibility for handling different food products.
4. Dehydrating conditions accurately controlled.
5. Minimum use of strategic materials.
6. No trays or trucks required.
7. Low operating costs.
8. Capacity up to 30 tons of raw product per 24 hours, requiring only one man to operate.

PROCTOR & SCHWARTZ • INC • PHILADELPHIA

• RICED, STRIP, JULIENNE, DICED OR CUBED POTATOES • SLICED, DICED AND JULIENNE CARROTS • DICED AND JULIENNE BEETS • DICED TURNIPS • DICED RUTABAGAS • SHREDDED CABBAGE • SWEET POTATOES • MEATS AND OTHER FOODS

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Come Now! It Isn't Going to Last Forever!
NOBODY KNOWS HOW I'M GONNA MISS YOU!
THE OLD CAN-OPENER
CANNED GOODS
WARTIME RATIONING ORDER
THE PANTRY SHELF

These cartoons made us proud

WE are proud because they told millions of American newspaper readers that the can has *really gone to war.*

We are proud because they emphasize what the can manufacturing industry, the canning and packing industries are doing . . . can do . . . and will do for the one job before us all: the winning of the war.

Nothing is too good for our fighting men, and experience has shown that the can is the one satisfactory container for carrying all kinds of war supplies and getting them there—*safe.* Our purpose for 1943 is to turn out the cans of war faster and better than ever before.

We see a great future for cans and the products they protect. Vast improvements have been and are being made in steel, tin plate, can making and canning methods. With canned products being used all over the world, now and in the future, there will come a recognition of our industries in the nation's economy such as has never been known.

This is our pledge—and our hope—for 1943.

Charles C Conway

CHAIRMAN OF THE BOARD

CONTINENTAL CAN COMPANY

Tomorrow's Milk WILL COME IN PACKAGES

Buell Powder Collectors Check Losses from Your Spray Dryers

In milk powder production—one of dehydration's biggest jobs—the amount of powder that may be lost in the spray dryer exhaust gases has been estimated to run as high as 15%! Similar high losses are frequent in the dehydration of eggs, soup mixtures, citrus juices and other foods.

This is needless waste. Buell Powder Collectors, installed as an integral part of your spray dryer hook-up, can eliminate these losses almost completely; and material recovered will quickly pay for your Buell installation.

Buell Powder Collectors specially designed for food processing are made of special metals to meet all Pure Food requirements. Corners are rounded to prevent lodgement of material, and an ingenious hinged construction facilitates take-down for easy cleaning.

The high efficiency of Buell collectors is due to the patented van Tongeren cyclone—an exclusive Buell feature. Buell Powder Collectors have no moving parts, require little or no attention, will not clog, and cost little to operate.

Write for factual 28-page book "Bulletin FI-2"

BUELL ENGINEERING COMPANY, INC.
Suite 5000—8 Cedar Street, New York
Sales Representatives in Principal Cities

BUY WAR BONDS AND MAKE THE AXIS BITE THE DUST

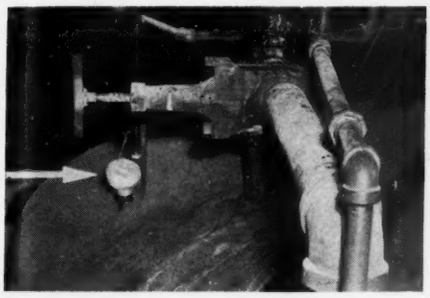
CONSULT BUELL *First* IN DUST RECOVERY
for Chemical • Rock Product • Metallic • Food • Flue or any other dusts

buell
DUST RECOVERY SYSTEMS

Kettle Operator Guided By Micromax Pyrometer

The operator of a processing kettle for plastic resins in the Elizabeth, N. J., plant of Reichhold Chemicals, Inc., has just paused at the Micromax Pyrometer to see how closely he is controlling the temperature within the kettle.

This comparatively low temperature must be recorded both accurately and promptly, because it must be changed from time to time, according to a pre-arranged, close cycle. Micromax is particularly well suited to this service, because the operator can either read its bold scale from a distance or can consult its clear record.



Portion of head of resin kettle. Arrow indicates the simple, strong, easily-opened head of the L&N Thermocouple which is detecting temperature of resin. Couple, or its leadwire, or both, can be repaired or replaced by the user, without in any way affecting the calibration of the Micromax.

Appealing, too, to many users is the fact that Micromax is a fine machine as well as a micro-responsive instrument. Its solid construction and crisp, powerful operation are principal reasons for its widespread use, for controlling the temperatures detected by Thermohm electrical resistance thermometers, thermocouples or Rayotube radiation detectors.

Micromax Pyrometers are made in 5 models; hundreds of ranges. Particulars are in our catalogs; outline your problem and we will send the appropriate publication.

Jrl. Ad. EN-0880(5)

pH Indicator in use in a Merck Process Control Laboratory.

Checking pH with L & N Indicator

Is "Easy and Accurate" at Merck & Co., Laboratory

Wartime restrictions forbid a detailed report of the uses to which Merck & Co., Inc., are putting their pH Indicator, in the production of fine chemicals, drugs and vitamins at their Philadelphia plant. It can be said, however, that the instrument is in daily use and provides "easy and accurate" measurements of a great variety of materials.

The Indicator is a Leeds & Northrup No. 7662; it is entirely self-contained, portable, dependably accurate. It's only necessary to pour the sample into the Indicator's standard 50-ml beaker, and read pH directly from the meter scale. Instrument characteristics include:

1. It can operate in atmosphere of 95% relative humidity and temperature up to 30 C (85 F); is thus ideal for muggy weather or in hot, damp processing rooms.

2. Maintenance is negligible: add KCl crystals to the salt bridge every 6 or 8 weeks; clean electrode occasionally; replace dry cells at infrequent intervals. Electrodes are filled and sealed at factory. Batteries are in separate compartment, away from the rest of the electrical circuit.

3. The Indicator's double range of 0-8 pH and 6-14 pH provides a 2-pH overlap which is especially convenient when titrating. The instrument's electrodes are on 15-inch leadwires, hence can reach into titrating vessel alongside Indicator. Sensitivity and easy-reading features make this instrument ideal for titrations.

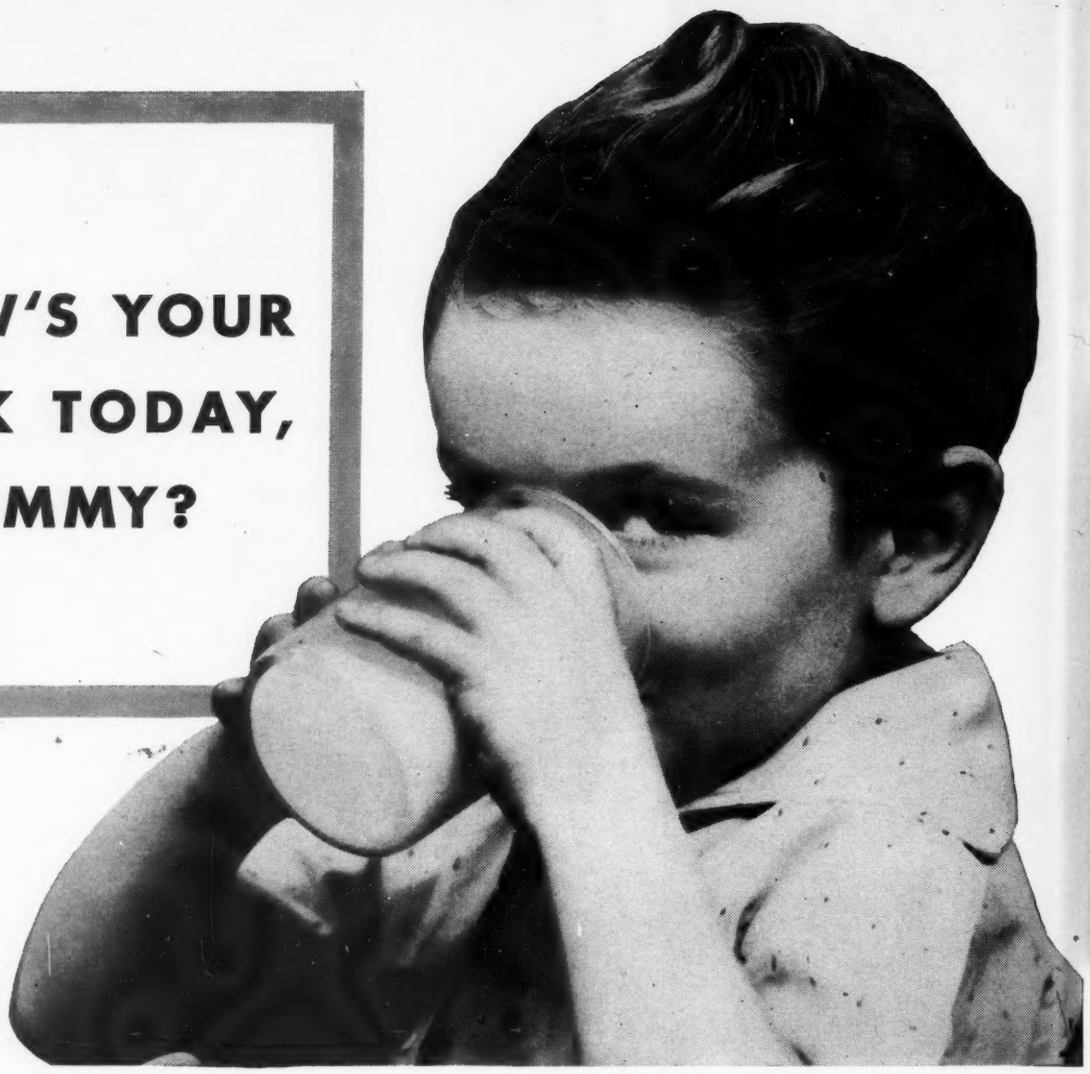
This sturdy, well-made Indicator is described in Catalog E-96(2), sent on request.

LEEDS & NORTHRUP COMPANY, 4912 STENTON AVE., PHILA., PA.

LEEDS & NORTHRUP

MEASURING INSTRUMENTS · TELEMETERS · AUTOMATIC CONTROLS · HEAT-TREATING FURNACES

HOW'S YOUR MILK TODAY, JIMMY?



IS it sweet to the taste? Is it up to par in its nutritive and vitamin content? Is it pure and free from metallic contamination?

The answers are "Yes!" if Jimmy's dairy has stainless steel equipment for collecting, storing, filtering, pasteurizing, cooling and bottling fluid milk.

More and more dairymen have come to depend on U·S·S Stainless Steel as the truly *safe* material for handling milk products. It's easy to keep spotlessly clean. It is non-toxic, and will not dissolve in milk. Stainless protects the flavor, nutritive and keeping qualities of dairy products.

Producers of virtually all types of foods find that this amazing metal not only protects product quality and plant sanitation—but it has the stuff to stay on the job for years to come. Ask any equipment maintenance man about stainless' unmatched resistance to corrosion and wear! He'll tell you that, with proper care, stainless equipment lasts almost indefinitely.

Now that food industries must turn out their maximum production of essential foods—and do it largely with existing equipment—how fortunate that so many plants already are outfitted with stainless steel! We know how food producers prize the stainless steel equipment they're lucky enough to have. But just wait till you see tomorrow's equipment! Stainless is destined for even greater usefulness in almost every food industry. Even though you can't buy stainless equipment today, it's good business to start thinking now about how you can use this versatile material to make your plant more productive when peace returns and U·S·S Stainless Steel is plentiful.

***"Be glad it's Stainless . . .* it lasts longer!"**

U·S·S STAINLESS STEEL

AMERICAN STEEL & WIRE COMPANY, *Cleveland, Chicago and New York*
CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
COLUMBIA STEEL COMPANY, *San Francisco*
NATIONAL TUBE COMPANY, *Pittsburgh*
United States Steel Supply Company, Chicago, *Warehouse Distributors* • United States Steel Export Company, New York

UNITED STATES STEEL

Don't Sacrifice Eye Appeal in Your Wartime Package!

Switching from the old familiar package to a wartime successor? Before you go too far in your plan-making, be sure to give due consideration to one of the first merchandising principles of packaging . . . that of eye appeal.

You're right . . . a package should be functional, practical, protective, economical. And today it must be manufactured of materials that are available. But . . . eye appeal needn't be sacrificed to meet the wartime restrictions. Beauty and utility can be combined today as always!

Reflect the high quality of your product with high-quality packaging. If you are confronted with a packaging change-over, above all retain brand identity. Preserve those recognition features familiar to your customers, even though you find it necessary to alter the style or shape of your package.

Perhaps we've given you an idea here. It may be that we can assist you in your particular problem. Why not consult us? Our staff of packaging experts stands ready to serve you.

As one of the world's largest producers of packaging and high-quality lithographed materials, we invite you to toss that problem of yours into the collective lap of our designers, engineers and chemists. Maybe your problem isn't as tough as you think it is!

Stecher-Traung—pioneers in Full Color Lithography and leaders in the field for over three-quarters of a century—can give you efficient service. Our unique "Gang Run" Service assures you of real savings.

Contractors to the Government—War Work Comes First!

For over 75 years—headquarters for high-quality, colorful, lithographed labels, box wraps, packets, folding boxes, cartons, merchandise cards and envelopes, displays and advertising materials.

FREE!

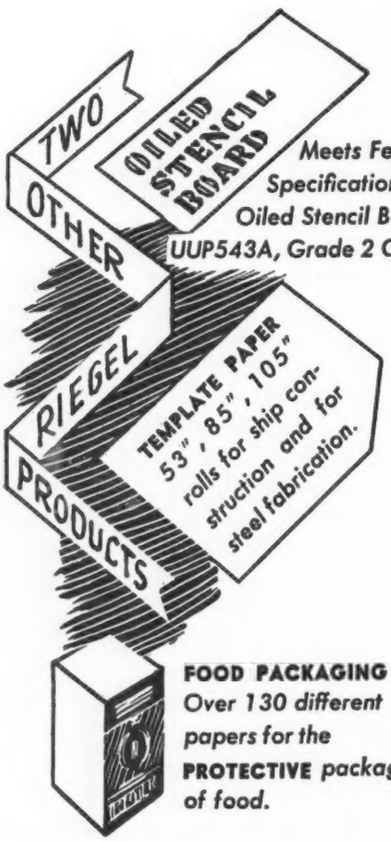
Write today for your free copy of our 28-page book—"The Value and Patriotic Use of Full Color."

STECHER-TRAUNG
LITHOGRAPH CORPORATION

Rochester, N. Y. **San Francisco, Calif.**

Offices in Principal Cities

When Food is Shipped to SHANGRI-LA



Meets Federal Specifications for Oiled Stencil Board, UUP543A, Grade 2 Oiled.

53", 85", 105" rolls for ship construction and for steel fabrication.

FOOD PACKAGING
Over 130 different papers for the **PROTECTIVE** *packaging of food.*

Today, few food packers know where and when their product will be used. Lend-lease and military requirements call for complicated packaging of new forms of food for delivery to many Shangri-Las. This revolution in packaging methods must be accomplished quickly and with a minimum of strategic materials.

We are helping to do this through the application of time-tested papers and combinations of packaging materials of known values, or through the development of new papers where necessary.

WE BELIEVE WE CAN HELP YOU to solve almost any paper problem. Our four mills make over 230 different grades for packaging, printing, converting and special industrial use—papers that have been tested, approved and adopted in all fields. If we cannot help you, we will be glad to refer you to someone else who can. Write us your requirements.

342 MADISON AVENUE • NEW YORK, N. Y.

RIEGEL PAPER CORPORATION

78A

How to calculate Rate of Heat Flow through Metallic Walls

As a result of work done by INCO Technical Service, a new booklet, "Heat Transfer through Metallic Walls," has recently been printed.

It explains in detail how to calculate heat transfer, and covers conductance values of film, scale, and condensing vapor film. It also includes tables on thermal conductivity of various metals, conductance ranges for metallic walls and films and other phases of the subject.

A valuable section of "Heat Transfer through Metallic Walls" consists of charts on heat transfer co-efficients for 11 different metals:

Copper	Lead
Aluminum (2S)	Cupro Nickel (70-30)
Red Brass (85-15)	Monel
Admiralty Brass	Inconel
Mild Steel (SAE 1020)	Stainless Steel (Type 430)
Nickel	Stainless Steel (Types 304, 316, 321)

In addition to the information contained in this bulletin, INCO Technical Service will gladly furnish personal assistance in the solution of specific heat transfer problems.

For copies of "Heat Transfer through Metallic Walls" please mail the coupon below.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street **New York, N. Y.**

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York, N. Y.

Gentlemen:

Please send me.....copies of your bulletin, "Heat Transfer through Metallic Walls" to:

Name.....

Title.....

Company.....

Address.....

F.I. 2-43

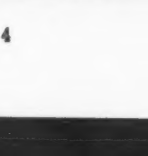
CHEVROLET TRUCKS
Vehicles of Victory

ON THE FIGHTING FRONTS—ABROAD

Chevrolet trucks—like much other Chevrolet-built equipment—are fighting side by side with our fighting men in all parts of the world.

ON THE WORKING FRONTS—AT HOME

Serving Agriculture • Serving Industry
Serving All America



War Carriers for the Nation

CHEVROLET MOTOR DIVISION, *General Motors Corporation*, DETROIT, MICHIGAN

IN DEHYDRATION Quality Control Comes 1st

Immediately AVAILABLE

At the present time shipments are assured within 4 WEEKS.

Better Act Now!

BRILSONAIR Conditioning

The *positive* control of the quality and uniformity of your product must be the first and major consideration in the purchase of food dehydration equipment.

Successful control requires 3 all important factors

1. *Control of temperature*
2. *Control of humidity*
3. *Control of air motion*

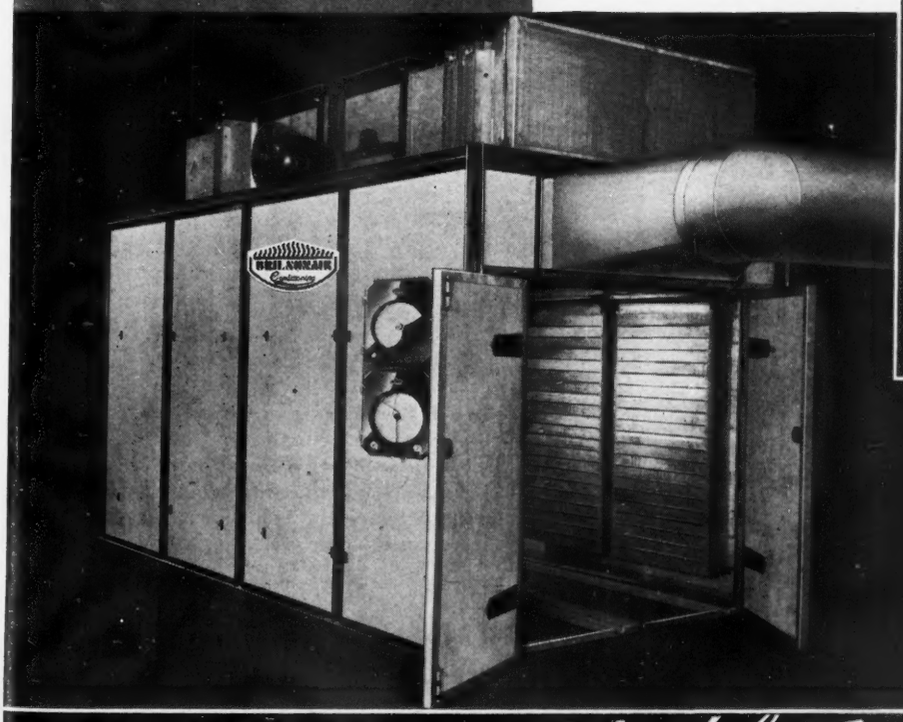
In the Brilsonair Dehydration Process—food processors will find the *positive* method of scientific control—not of one—not of two—but of all three factors.

The Brilsonair Duplex C20 (illustrated) is an original scientifically designed unit combining the best features of compartment, tunnel and apron type machines. It is a product of air conditioning engineering. Its mechanical simplicity and fool-proof operation assures continuous controlled quality production.

Get the New Brilsonair Catalog. It takes the mystery out of Dehydration. It shows with diagrams—a set-up for controlled quality production in 2-hour cycles. It is simplified and to the point. Send coupon today for your copy.

BRIDGES-WILSON CORPORATION

206 Mass. Ave., ARLINGTON, MASS.



FILL IN COUPON

Bridges-Wilson Corporation
206 Mass. Ave., Arlington, Mass.

Please send a copy of your new Food Dehydration Catalog.

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Firm .....

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BRILSONAIR for *Flexibility* of PRODUCT · CONTROL · PLANT LAYOUT

We're honestly proud of this one . . .

WHEN THE FIRST TORPEDO, made by Canco's subsidiary—the Amertorp Corporation—splashed into the water last year, Navy officials acclaimed its excellent performance.

This was the forerunner of great schools of such "tin fish" which have since been delivered by Canco to our fighting forces.

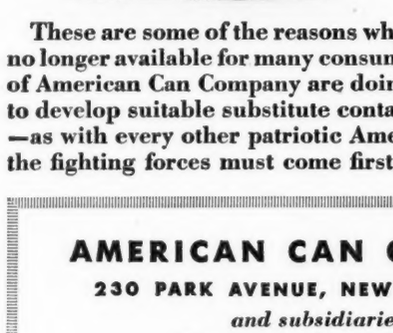
These torpedoes are made entirely by Canco—from war-head to whirling propellers. Even their intricate controls and propulsion mechanisms, as delicate as those of a fine-jewelled watch, are tooled and produced by Canco craftsmen.

Certainly, these incredibly complicated implements of war seemed a far cry from Canco's peacetime metal containers. But, the difficulties of the job were merely a challenge to Canco engineers. Here was a task which appealed to their imagination . . . taxed their skill. Today, the results they have achieved in making these torpedoes are a credit to their technical ability and ingenuity.

In addition to complete torpedoes—

Canco men and machines are also providing metal containers for parachute flares, emergency water rations, demolition kits . . . and for a host of other vital war needs.

Canco is making hermetically sealed first-aid kits . . . portable blood bank containers . . . field-ration containers . . . literally millions of units.



In addition, Canco Machine Shops, once used to build and maintain Canco machinery, are now employing much of their equipment to produce specified tools and essential parts for weapons of war.

These are some of the reasons why metal containers are no longer available for many consumer products. True, we of American Can Company are doing everything possible to develop suitable substitute containers. But with Canco—as with every other patriotic American manufacturer—the fighting forces must come first.

AMERICAN CAN COMPANY
230 PARK AVENUE, NEW YORK, N. Y.
and subsidiaries
The Amertorp Corporation
The Ammunition Container Corporation

Mining—Number One War Industry

The mineral products of the earth are the prime necessities of war... and peace

THE SURFACE of the earth provided primitive man with the things he needed for his meager existence but civilization really began when he became curious about its interior. This curiosity has brought us a long way. For the earth has yielded — out of its deep recesses — all the raw materials of modern industry. And today, in the grueling race of production, our mining industry is providing the raw materials upon which depends our survival. Our mines and quarries must supply a long list of materials without which a successful war cannot be fought.

Take steel, for example. War without steel is inconceivable. Steel starts with iron ore, limestone and coke. These are products of mines and quarries. It takes power and heat to get these materials out of the ground, to refine them and to transport them to the point where processing begins. All the subsequent operations culminating in the steel ingot, shape or plate, and in moving the final product to the point of use require power and heat.

The major source of this power and heat is coal.

Production of a ton of steel, it has been stated, requires two tons of coal. Smelting of the pig iron alone, 60,000,000 tons in 1942, required the coking of some 75,000,000 tons of coal. Pig output is expected to rise to 68,000,000-70,000,000 tons in 1943, carrying coal consumption up to 85,000,000 tons. At the same time, output of steel ingots is expected to rise from 87,000,000 to 97,000,000 tons. Think what this means in terms of power and heat.

Another vital metal is copper. Modern armies need copper. This point is dramatically illustrated in a recent memorandum by Robert P. Patterson, Under Secretary of War, in announcing the release of 4,000 men from military service to return to the mines and increase copper production. "In a single minute of combat", Mr. Patterson declared, "a flight of 50 fighter planes shoots away 7 tons of copper. A 37-mm. anti-aircraft gun uses up a ton of copper every twenty minutes it is in operation. Six hundred pounds of copper go into every medium tank, and a ton into the engines and airframe of a Flying Fortress. The Signal Corps alone needs 5,000 tons of copper every month for radio and telegraphic and telephonic equipment. An army without copper would be an army without speed, maneuverability or firepower. It would not last a day in battle".

Seven tons of copper for one minute of combat by 50 fighter planes means from 200 to 700 tons of ore, depending upon its grade. Small wonder that the War Department was willing to release drafted miners from military duties to produce more copper.

But other metals are equally important in war: tungsten, nickel, manganese, chromium, vanadium and molybdenum for alloy steels; zinc for brass and die castings; tin for bronze and bearings; aluminum and magnesium for aircraft; lead and mercury for ammunition; silver for electrical equipment, bearings and solder, and so on. Even relatively insignificant non-metallics, like mica and diamonds, suddenly assume critical importance.

And let us not lose sight of the fact that without adequate energy, i.e., heat and power, production, processing, transportation and the relative comforts to which we have become accustomed would be impossible under war conditions. Coal is the major source of energy in the United States. It supplies more than half the total in normal years.

The railroads of the country alone used 110,000,000 tons in 1942 to move freight and passengers and service their facilities. Utilities consumed over 68,000,000 tons in the production of electric power. Over 135,000,000 tons of coal were consumed last year in maintaining the level of heating comfort necessary for the maintenance of efficiency and morale. The consumption, this year, will be even greater.

In short, the mineral products of the earth are the prime necessities of war.

The nations that control the world's mineral resources and make the most efficient use of them will win the victory.

Before the war, the British Empire and the United States together controlled probably 75 per cent of the world's mineral production. This would have been a most potent weapon in the United Nations' arsenal if the whole strategy of Axis expansion had not been influenced by mineral objectives. Addressing the American Zinc Institute on the subject last April, E. W. Pehrson, of the U. S. Bureau of Mines, estimated that the Axis had improved its position in world mineral resources in the following percentages: iron ore, from 6 to 46; steel production capacity, 20 to 34; petroleum, 1 to 7; coal, 27 to 53; copper, 5 to 10; lead, 7 to 22; zinc, 16 to 27; tin, 1 to 72; manganese, 2 to 30; chrome, 3 to 30; tungsten, 6 to 60. In the light metals, areas now Axis-controlled produced in 1940 54 per cent of the world's aluminum, 49 per cent of the bauxite (the principal source of aluminum) and two-thirds of the magnesium.

This is the eighth of a series of editorials appearing monthly in all McGraw-Hill publications, reaching more than one and one-half million readers, and in daily newspapers in New York, Chicago and Washington, D. C. They are dedicated to the purpose of telling the part that each industry is playing in the war effort and of informing the public on the magnificent war-production accomplishments of America's industries.

Despite these gains, the industrial war power of the United Nations still can outweigh that of the Axis by a considerable margin. It already has begun to surpass it. The problem is to convert quickly our potential mineral resources into implements of war. In this conversion, a heavy burden of responsibility has been placed on the mining industry of the United States as the largest producer of many metals, minerals and fuels. In fact, the United States mining industry began to go on a war basis a year before Pearl Harbor. The curves of demand for domestic copper, lead, zinc and other metals began to rise sharply in 1940, and were paralleled by a rising coal production.

How well the job has been done cannot be revealed in accurate figures in many cases because of censorship. In metals, however, some idea of production gains can be indicated in comparative terms. United States copper production, for example, is breaking all previous records. Aluminum capacity will be more than seven times its annual peace-time average. Magnesium plants now building will have a capacity 100 times the largest yearly before-the-war figure. Molybdenum, of which the United States has the largest single mine in the world, is being made available in record quantity. Zinc, lead and mercury are surpassing expectations in meeting wartime demands, and tungsten, chromium, manganese, antimony and iron and steel are being turned out in record-breaking quantities.

Bituminous coal production in 1942 was 580,000,000 tons, the greatest in history, valued at more than $1,300,000,000 at the mine. Some 430,000 or more men were employed in 1942 and received at least $750,000,000 in wages. Bituminous production in 1939 was 394,855,000 tons, while the output for 1943 is forecast at approximately 600,000,000 tons — another new United States record. The 1942 anthracite output was 59,961,000 tons, valued at over $270,000,000 at the mine. The industry employed some 85,000 men and paid out at least $180,000,000 in wages. The 1939 production of anthracite was 51,487,000 tons, and the forecast for 1943 is 65,000,000 tons or more.

Marshalling the Western Hemisphere's mineral resources, the United Nations have been the beneficiaries of the diversified resources of two continents — in particular of Canada's nickel and coal, Mexico's lead and antimony, Chile's copper, Bolivia's tin, Peru's vanadium, Brazil's iron, and Venezuela's petroleum. With other United Nations contributing their share of metals and fuel, the grand total is an impressive array of potential munitions and matériel to lend assurance of certain victory over the Axis. Sheer weight of metal, properly used, will win the war, and our mineral industry will have played an indispensable and essential part in the inevitable outcome.

President, McGraw-Hill Publishing Company, Inc.

FOOD INDUSTRIES

FOR THOSE WHO CONTROL QUALITY THROUGH MANAGEMENT AND PRODUCTION

LAURENCE V. BURTON, Editor

FEBRUARY, 1943

The Talk of the Industry

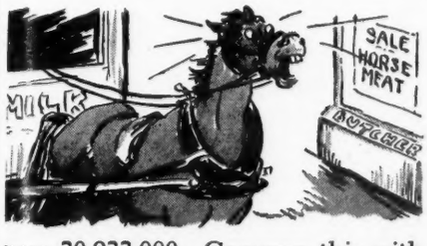
• BAD news: Three-fourths of one percent of all the copper to be produced in the United States in 1943 has been allocated to the use of the civilian population.

• APROPOS of all the legislative proposals to mobilize scientists, technologists and all research workers *a la* the Kilgore bill, a friend proposes the idea that all lawyers be organized in a Legal Mobilization Corp.

Since the lawyers think they know how to mobilize and administer research and development work on a nation-wide scale, the Legal Mobilization Corp. should be organized by first class researchers to direct all legal and legislative work.

Under the Legal Mobilization Plan, the director and his underpaid assistants shall review all legal activities in the country and stop those which seem to them to be superfluous or not directed toward the winning of the war. Lawyers who run for public office will be examined by the corporation to determine their suitability to the proposed jobs.

• INCIDENTAL Intelligence: In 1941 there were 10,364,000 horses in the United States, whereas in 1919 there



were 20,922,000. Compare this with 72,094,000 cattle in 1919 vs. 71,666,000 in 1941. If horses are needed for transportation and farm work just how many can be used for food?

• NEARLY all year-end statements from the heads of large food companies took refuge in Food Administrator Wickard's earlier assurances that there will be adequate food to maintain health and morale. Which is passing the buck to a man who is scared stiff lest there be a severe drought in the United States.

• WPB announces the new Food Administration as a "Claimant Agency" under the Controlled Materials Plan. This means that a definite amount of certain critical material, notably steel, has been allocated to the Administration for use in augmenting food production and processing.

• SPEAKING of the Food Administration, the boys in Washington who work out names and initials for the alphabetical agencies revealed their unfamiliarity with the food processing industry by referring to FDA as the short for Food Distribution Agency. Food processors come under the jurisdiction of this agency. Ever since we can remember FDA has previously referred to the Food and Drug Administration.

• SEA water for the wetting in bread dough is said to improve taste and digestibility—a discovery by the German army bakers in Rommel's Afrika Corps, according to Captain G. Buehlmann in *Schweizerische Militärzeitung*, July, 1942.

• WHEN a Senate Commitee threatens this department with a subpoena if we fail to appear for a hearing, it's the height of something or other. We can't figure out whether it's because we are becoming important—or more likely, merely a nuisance.

• SQUAWKS by Senator Reed of Kansas and many a consumer about the necessity to buy bread knives now that

slicing of bread by bakers has been prohibited stimulate many chortles originating below the belt. Is it possible that the family carving knife has been sent to the scrap heap because of the meat shortage? Or have we been using the wrong tool for slicing bread all these years?

• TIME was when commercially sliced bread was hailed as a stimulus to increased bread consumption; the thicker the slice, the greater the per capita consumption. But now Senator Reed is quoted by Associated Press as saying: "Housewives slicing bread undoubtedly will use more bread. Some estimates of the increase in the amount of bread which will be required because of home slicing go as high as 20 percent." So now you have the reason for the long decline in wheat consumption.

Is Compulsory Grade Labeling Coming?

Everybody who has any common sense abhors the thought of the runaway price rises that characterize inflation, yet as long as the government clings to its present method of price control in detail at several hundred thousand retail outlets, it is inevitable that upgrading will be a problem for OPA to solve if price control is really to control. As long as the price differential between quality grades offers to the unscrupulous a way to reap an unjustified price markup, there exists a golden opportunity to certain zealots to inflict compulsory grade labeling on food processors, and as long as current scarcities compel consumers to take what they can get and like it, the unscrupulous occupy a strategic advantage.

Nobody in his right mind wants inflation. OPA's job is to prevent it, but a considerable body of OPA opinion is toward the use of compulsory grade labels as a means of avoiding inflation. While most of the furor concerns primary processors, especially canners, it must be noted that a few secondary processors of fabricated foods, for which legal standards of identity are largely nonexistent, have not helped the situation for brand merchandising. Some of them have been forced to cut corners by reason of scarcity of ingredients, and their products only resemble the former ones on which good brand reputations have been based. It is, of course, a manufacturer's privilege to degrade his brand or to protect it by selling different quality goods under a secondary brand.

It is doubtful if primary processors ever give thought to the basic differences between their own problems of brand selling and those of secondary processors. Primary processors are located near the source of raw materials—they cannot be anywhere else if the raw material is perishable. Secondary processors, with only a few exceptions, are, however, always located at convenient centers of population. Freight on the finished goods of the former is a large item of cost to the consumer, whereas it is a smaller item in the case of the latter. For example, California ice cream or biscuits, bread or confectionery seldom come to the Eastern Seaboard, but California canned spinach, asparagus and peaches and dried fruits cover the country.

OPA may succeed in foisting grade labels onto foods, but a compulsory label grade will not eliminate price differentials. FOOD INDUSTRIES no longer fears the blighting effect of compulsory grade labeling, as we once did many years ago. But we maintain that this is none of OPA's business and that such compulson is only a futile attempt to substitute one set of new problems for another set of old problems that are unsolvable simply because the present detailed system of price control is unworkable, and OPA ought to know it. In stating our position, we are not unmindful of the fact that there are in existence some people in manufacturing and more in distribution who will not play the game square except under compulsion.

Hors d'Oeuvres

• Coffee substitutes must be truthfully labeled, food officials warn. That is, you have to call a spade a spade and rubbish rubbish.

• *Several states plan to grow hemp in districts now producing peas and corn for canning. Does this pose a food problem? Well, try eating some pureed hemp.*

• Women in the South are digging into Civil War recipes to find substitutes for coffee. And Margaret Mitchell, author of "Gone With the Wind," recalls that Scarlet O'Hara "had a mixture of parched corn and ground up yams that passed for coffee, and she thought it repulsive." For once Scarlet was right.

• *Lease-Lend has purchased three million pounds of Cvinaya Tushonka.—You don't pronounce it, you eat it. It's a highly spiced pork product fed to Russian soldiers.*

• The OPA really has something in its point-rationing system for foods. Consumers will become so engrossed in how many points a hunk of meat costs that they'll forget to get mad about the price.

• *There are so many government orders controlling the sale of goods in England that the London Price Regulation Committee has set up an information bureau to help shopkeepers. OPA please copy.*

• "Your markets are not standing armies but passing parades," observes a beverage bottler. Here today and gone with the wind of a competitor's advertising copy.

• *The job ahead for dehydrators might be summed up as that of preventing a revival of that 1918 Army ditty:*

They feed us carrots every day
That taste just like alfalfa hay
Hinkey dinkey parlez vous.

• "Soon one out of every four workers in American war production will be a woman," says McNutt. That calls for forewomen.

• *Wartime slogan for companies selling butter: "If you can see it when you spread it, it's too thick."*

• What next? They have found a food-field application for flame throwers. An Oregon onion producer burns the weeds out of the rows with flame applied in sheet-metal tunnels pulled by a tractor. It burns the tops off the onions, too, but onions can take it.

• *As a move to avoid waste of food, the Navy is telling sailors to "take all you want to eat, but eat all you take." Bet it sounds just like home to the boys.*

• It has been reported that too little riboflavin in the diet makes rats lousy. Which helps to explain December 7—there's no riboflavin in polished rice.

• *Point rationing, says OWI, will result in new tastes on the tongue, less impulse buying and a fresh regard for quality—and, it might be added, a belated appreciation of the importance of the food manufacturer.*

F.K.L.

The Food Processors' Conference

Varied opinions have been expressed by the members of the food processing industry who attended the government-sponsored conference in Chicago, December 14–16, 1942, but after a month has elapsed it appears that very little real good was accomplished other than to inform the industry that enormous and grave problems faced them.

It was not, however, entirely the fault of the government spokesmen that the maximum good was not attained. The timing of this conference could hardly have been worse, for President Roosevelt chose this particular period to order the creation of the Food Administration after considering the problem for a year. Consequently, the meeting occurred "between grass and hay," no authoritative plan could be matured, and no definite figures could be given to the eager processors who were there to be told what was expected of them. One spokesman was aroused at 5 A.M. by

a phone call from Washington to receive information necessitating a complete revision of his prepared remarks before 9:30 A.M. when they were to be presented.

How much of the responsibility for failure of the conference to live up to its opportunity should be credited to the President or how much to ineffective staff work is problematical. This is not the first time that the President has vitiated the effects of a conference by his own acts. The lamented London Economic Conference, The National Nutrition Conference and now the Food Processors Conference have suffered in the same peculiar manner.

Bread Bakers Have Their Troubles

That the new Food Administration is not yet a smoothly functioning body and lacks all the authority it deserves is apparent from the first order it has issued, the one covering bread which is printed elsewhere in this issue. To anyone who has a little behind-the-scenes information the Food Administration seems to be suffering from the chronic complaint in Washington —*Lawyeritis*. The latter is the legal touch of smart young lawyers who introduce their concept of social reform into many a document without regard to what the administrative officers may have intended.

Taken with OPA Order No. 1389, which raises the ceiling on flour but prohibits raising the price of bread and alters the formula for bread, Food Administration Order No. 1 shows the defects of the Executive Order creating the Food Administration (printed on page 45, January, 1943, FOOD INDUSTRIES). The divided responsibility over the food situation is characteristic of almost all the similar acts of the President. Oil and rubber are other horrible examples of the President's inability to create an administrative office with clean-cut, competent authority. The Food Administration evidently proposes and OPA (aided and abetted by James F. Byrnes, Economic Director and No. 2 President) disposes.

The Food Administration order prohibits stale returns to bakers, which would normally amount to 250,000,000 lb. of bread a year, which is calculated to be equivalent to $0.58 per barrel of the flour used by the bakers. Of this huge amount of stale bread, there would be a very considerable amount lost to human consumption. Ralph Ward, president of American Bakers Association, estimates that in the prohibited stale returns the following amounts of ingredients would be saved: Shortening, 4½ million pounds; dried milk, 5½ million pounds; sugar, 6 million pounds. Slicing, twisting and cross-panning are also prohibited. The maximum number of varieties of specialty items is fixed to cut down on stales. So far, so good.

Where the bakers' ire is aroused is in the OPA order to permit higher priced flour but prohibiting the bread price from going up. Byrnes is sold on the idea, but nobody in the baking fraternity professes to know how OPA expects the cost of bread to remain fixed in the face of increasing ingredient costs. Apparently OPA is proceeding on its customary theory that an increase in volume of business will so reduce the unit overhead cost that this reduction will compensate for the increased material costs. Leon Henderson and other New Deal economists have frequently preached that doctrine, which most business men know to be fallacious unless, by happy circumstances, a given company's experience conforms exactly to theory. (New Deal theorist, Benjamin V. Cohen, is one of James F. Byrnes' assistants.)

If we examine the whole affair it appears unlikely that OPA theory will work as scheduled, and the bakers stand to lose varied amounts of money. Admittedly, the foods made from cereal grains are due for an expanded consumption. Demand for bread can be expected to increase as supplies of other foods are rationed. But, and here is a big *but*, there is not enough shortening, dried milk or sugar available to produce breads of customary formulas in an expanded volume. Hence OPA calls for a "degraded" formula, something the bakers abhor because of its unpalatability and bad effect on consumption.

Degrading the Formula

The degraded formula calls for 2 percent shortening *vs.* the customary 2 to 4 percent; 4 percent of sugar *vs.* the customary 5 or 6 percent; and 3 to 4 percent of dried milk *vs.* the customary 4 to 6 percent. By this formula cut, the OPA and Food Administration seem to expect to stretch the limited supply of ingredients. Bakers fear that it will save ingredients at the expense of total bread consumption. And with butter strictly rationed on the basis of 70 percent of normal consumption, plus restrictions on jams, jellies and other spreads, and inability of margarine manufacturers to meet their increased markets, it appears likely that the less palatable bread of the near future will decline in popularity. Bread bakers resent the imposed formula control for they have been fighting a 20-year battle to stem the per capita decline of bread consumption.

Vitamin enrichment of the new bread is required, but one wonders if OPA consulted the Defense, Health and Welfare Agency on the nutrition phase. There is far more to adequate nutrition than vitamins alone. Minerals, proteins, fats and good old-fashioned calories are also important.

Price-ceiling relief on flour seems to have precipitated too hasty action. In all this there is evidence of the long-continued lack of comprehensive overall planning on an adequate scale. Let us hope it can be soon corrected.

The current bread incident is one of the situations where overall food planning should have started a year or two ago, for the only outs seem to be either higher priced bread with formula degradation and long-time bad effects, or fixed-price bread without formula degradation, but at the expense of Lease-Lend shipments of the important lard and shortening and sugar.

It's a mess any way you look at it.

Deadline for CMP

February 9, 1943, is the deadline for receipt of your applications for critical materials by the various claimant agencies in WPB. If the application is not received by February 9, your need for scarce materials in the second quarter of the year will not be given any consideration under the plan. In the event your application fails to meet the deadline, then your only recourse is to the PRP method; but it should be definitely understood that CMP takes precedence over PRP applications.

Notice to Subscribers

Readers of FOOD INDUSTRIES will observe that the "trim size" of the current issue of the magazine is slightly smaller than that of previous numbers. The reduction in size has been made

to enable the publishers to meet an order of the War Production Board limiting the amount of paper that may be used in 1943. Subscribers will note, however, that no change has been made in size of type or in the amount of editorial content per page, but that a substantial saving in paper has been effected merely by trimming the margins.

The publishers have adopted the new size as a war measure and as a contribution to the conservation of manpower and transportation facilities in the production and distribution of paper. Service to the reader has not been sacrificed and will be maintained as far as humanly possible in the face of the problems confronting all of us in our united efforts to win the war.

Patent Law Revision

Much public discussion of the legislative proposal to revise the U. S. patent law emphasizes the prediction that it will stifle research. With this conclusion one cannot wholly agree. What seems more probable is that it will stifle patenting of the results of research if all comers are to be granted licenses under terms that are not likely to pay the cost of the work performed.

While we do not commend all the proposed changes in the patent law, we do not share all the dismay that exists regarding future researches and future patents. We do, however, believe that the changes in the patent law will have a decidedly blighting effect on technical progress in the United States.

Here is how the future will work out under such changes.

University research in fundamental science will continue, for fundamental laws of nature are not patentable, anyhow. Yes, researchers will research, as painters must paint, musicians must compose and explorers explore—because they can't be happy doing anything else regardless of monetary rewards.

Industrial research will, however, continue on much different lines than before. Results of research will be kept secret and, since products that are sold are naturally not a secret, the design or *modus operandus* of an article will be capable of widespread copying. This will stop most concerns from creating new things for the imitators to copy if the cost of such creation is substantial.

Methods of production will, nevertheless, still be worthy of research and will be constantly improved. But, to protect these developments from uncompensated imitation, the methods and processes will not be patented, plants will be barred to all visitors, and the utmost secrecy will be clamped down. The only way to find out what the other fellow is doing will be to hire away his employees who are in the know. That will mean that technical men in the processing field will be constantly lured from competitors at increasingly higher bids. In food processing the food technologist who really knows his stuff will command handsome salaries if his concern has made any important unpatented developments. Reason: The employer will have to pay through the nose to keep unpatented developments from escaping in this manner.

In the short view this might seem good, but is it? The inevitable result will be a decline in quality of the technical literature of the nation to as low a state as has existed in other countries where secrecy prevails. This lack of interchange of knowledge will spell the ultimate doom of the rate of progress that has characterized the good old U.S.A. up to now.

We have had a horrible example of the blight caused by repercussions from ill-advised social reform in the SEC. This New Deal development was to protect unwary investors from loss, but about all it has done is to stifle all bold and risky enterprise, both good and bad. And business has been chided for its reluctance to take a chance ever since the unwise legislation was enacted.

In patent law reform as projected we can see a comparable case. Socially and morally it may be as desirable as the SEC is alleged to be. But after 25 or 30 years of each we wouldn't know our country. You can't eat your cake and have it.

New Interpretive Journal

Nutrition Reviews, now in its fourth month of existence, deserves commendation and your attention if nutritional science plays any part in your affairs. Published by the Nutrition Foundation, Inc., New York ($2), it brings to the reader each month 32 pages of interpreted recent nutritional research in digest form. Its board of editors, headed by Prof. F. J. Stare of Harvard and comprising some of the most respected names in the field, is guarantee of its authority.

Its purpose is not to inform the lay public but to interpret nutritional scientific research to those who must apply it professionally, particularly physicians, nutritionists, dieticians and scientific writers. It is not written down to the level of the untrained mind.

Ship Building the Cause Of Food Rationing

FROM the way our national food reserves are melting away there must be a big reason—and that reason isn't the consumer hoarding which has been going on a plenty.

Although we have no access to inside information on the subject, there is one published fact that stands out boldly in the news—the success of our shipbuilding program. At last we are launching enough ships to begin to carry supplies to our allies. In 1942 our shipyards built 746 ships that averaged over 10,000 dead-weight tons each.

For some time it has been very clear that when enough ships were available we would no longer have comfortable food reserves. Recent reports in the newspapers indicate that we have about made up for earlier submarine losses. And that is probably why food rationing is now needed.

It's too bad, however, that OPA action has not been geared to AMA, Maritime Commission and War Shipping Administration operations so that there could have occurred a smooth-flowing transition from an economy of plenty to a skillfully rationed scarcity.

What is a Nonessential?

A "nonessential food" used to be dubbed as anything that the other fellow makes. A new and more potent definition is now beginning to take shape in the minds of WPB men. It goes like this: A nonessential (food or anything else) is anything that impedes or interferes with the war effort.

Here at last is something that begins to be a rational approach to a vexing problem. Furthermore, it affords the food manufacturer a sound basis for appraising his current position and planning for his future moves. It does not, however, tell him what does or does not interfere with the war effort.

BRITISH FOOD INDUSTRY GEARED TO WAR ECONOMY

Important though it is, food manufacturing must be subjected to certain severe restrictions to fit it into the best overall war program. This has been done in England, and British experience is cited here to show what could happen in this country*

IN this country we now face in the food industries the same vital and complex problem of coordination with the wartime program that Britain had to solve. And inasmuch as the moves that will be made here may in some degree parallel those made by the English, some idea of what lies ahead may perhaps be gained by considering British experience.

How food manufacturing has been concentrated in England was described in the October, 1942, issue of FOOD INDUSTRIES. And now three additional aspects of the problem will be considered—standardization, restriction and transportation.

The necessity for standardization of products in the food industries was recognized during the early months of the war. This simplification and reduction in varieties of "lines" has resulted in considerable economy in packing materials, manpower and transport.

Standardization of the bread industry is one of the outstanding examples of this policy. The weight and shape of bread are prescribed in orders issued by the Ministry of Food. The one shape of bread permitted is the oven-bottom loaf, and not more than two styles are permitted for Vienna bread and rolls. Bread may not be sliced before it is purchased by the consumer, and the wrapping of bread other than at retail counters is prohibited.

In order to avoid unfair competition and to maintain goodwill this standard or "national" bread does not carry labels or brand names.

Biscuits have also come under standardization. Manufacturers may not produce more than 20 "lines" as compared to 680 before standardization, and only one ingredient (chocolate) may be added after the biscuits have been baked. Furthermore, only bulk packaging of biscuits is now allowed, which effects considerable economy in packaging materials, manpower and transport. In the biscuit industry a large reduction in the labor required per ton of output has been achieved by these measures. The number of operatives was reduced from the prewar figure of eight per ton to five and one-half per ton by 1941.

Restriction

The Ministry of Food emphasizes that reduction of output is seldom the direct result of an absolute shortage of any particular ingredient. If a sufficiently high priority is given to any manufactured product, it may be said in general that the raw material can be obtained.

Factors such as nutritional value, distribution, access to raw material, processing, and so forth, are taken into account and a decision made as to the desirability of increasing or reducing a given product.

One example of the restriction of raw materials is the recent order of the Ministry of Food prohibiting the manufacture of table jellies and ice cream. Both of these industries require raw materials, packing materials, factory space, fuel and labor which could be better used in other directions. Table jellies require gelatine which is in short supply and urgently needed for more vital industries. The Minister of Food has received expert scientific and medical advice that these products, though popular with invalids and children, are in no way essential to anyone.

In the case of ice cream the use of milk has been forbidden for some time, and it is now felt that fats and sugar should no longer be used in a product which makes heavy demands upon specialized refrigerated transport and cannot be equitably distributed.

The canning of spaghetti, macaroni and vegetable salad with mayonnaise will be stopped shortly, and sugar which is available to the chocolate and sugar confectionery industry will be reduced by one-third.

Manufacture of these products was stopped on October 18, 1942: Cake, pudding and sponge mixtures, breakfast cereals, prepared breakfast foods, cured meat and bacon, meat and fish pastes, custard and blancmange powders.

(*Turn to page 115*)

Courtesy British Information Services

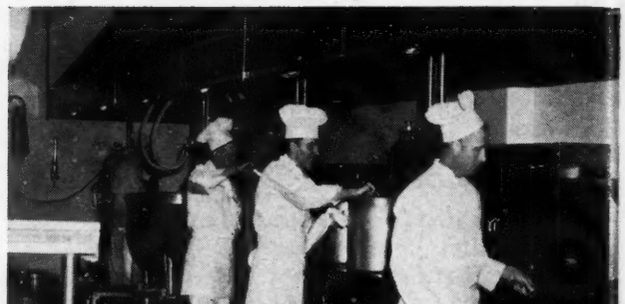
British food manufacturers save manpower by using women workers on many jobs formerly done by men, even some heavy jobs. Here, for example, you see heavy truckloads being moved by girls at a British chocolate factory.

* This article is based upon information from the British Supply Council, Washington, D. C.

Quick Frozen Cooked Foods Now in Demand

By CHARLES BOWES, Los Angeles, Calif.

Shortage of canned foods paves the way for wider acceptance of "meals" prepared in central plant and frozen to preserve them during distribution. Find retail and institutional markets



Expert chefs prepare cooked foods which are packaged and frozen after cooling to room temperature. Cooking is done on gas ranges and in steam-jacketed kettles. Ingredients are cooked separately to avoid overcooking of some and to retain natural flavor.

A NEW branch of the frozen food industry — quick frozen cooked foods—took a big step ahead recently when Fainer Frozen Foods Co., Pasadena, Calif., began distributing its "Magic Meals" quick frozen cooked foods through grocery stores in several western states.

This move comes at a time when many canned cooked foods are becoming scarce because of tin restrictions. The quick frozen foods fill a real wartime need and capitalize on a ready-made, big-volume market. The food trade has snatched up available supplies. Housewives have caught on quickly and are buying their convenient ready-to-serve foods at frozen food cabinets, instead of the canned-goods shelves. The Fainer officials are emphatic, however, in pointing out that quick frozen cooked foods are here to stay.

"Our products are pinch-hitting, during the wartime emergency, for canned foods," said Joseph L. Fainer, owner of the company, "but we're confident they will win and hold a substantial market and become a permanent factor in the growing frozen food industry."

He bases this confidence on three things: First, quick frozen cooked foods retain a superior "fresh-cooked flavor;" second, they keep indefinitely under proper refrigeration; and third, costs and selling prices are "in line" with canned goods of comparative quality, even under the present scale of operation.

The first three items introduced to the retail trade are: Boston baked beans, spaghetti and tomato sauce, and chile con carne. Others, such as soups, meat and meat dishes, poultry and fish, successfully distributed to the restaurant and institutional trade since 1938, will follow. Unsolicited orders already have been received from eastern distributors, but at present the Fainer plant is working to capacity to supply the demand in Pacific Coast and Rocky Mountain states.

The application of the quick freezing process to cooked foods was originated and has been developed by Harvey Striplin, now general manager of Fainer Frozen Foods. He has been getting ready for the present opportunity for the last five years. As a restaurant operator in San Mateo, Calif., Striplin was confronted with the usual problems: How to cook a suitable variety of foods in economical quantities; spoilage of leftovers; variations in quality and cost. He thought quick frozen cooked foods would solve these problems.

He found that the field was wide open, so he equipped a small pilot plant in San Mateo and began selling "Harvey's" quick frozen cooked foods. William M. Stewart, of the frozen food brokerage firm of Stewart and Sheedy, came into the picture at this time and has directed sales ever since. After thorough study, he produced a 40-page manual giving detailed instructions, recipes, complete menus and cost breakdowns and covering every possible question or misunderstanding on the use of quick frozen cooked foods. Featured points included: Uniform quality, measured servings, exact cost and profit control, elimination of waste, reduced overhead and labor. In the last four years, a sizable bulk-market has been developed among restaurants, lunch counters, institutions, airlines, and so forth. The variety of quick frozen cooked foods has been expanded to include a wide selection of entrees, which can be served as needed and require a minimum of labor and the simplest heating equipment. The following partial list of frozen cooked foods successfully sold to the commercial bulk trade gives some indication of the possibilities of expansion in the retail grocery field:

SOUPS: Asparagus; chicken; clam chowder; lima bean; mongol puree; onion; split green pea; cream of tomato; vegetable.

BEEF: Liver; Spanish meat balls; baked meat loaf; pot roast; roast beef; sirloin tips with mushrooms; chicken-fried steak; filet mignon; Manhattan steak with tomato sauce; rolled, stuffed sirloin steak; Swiss steak; vegetable stew; stuffed bell peppers; beef tips with Spanish sauce.

FISH: Fish cakes; halibut cutlets; halibut steak; baked salmon; salmon loaf; whiting.

GRAVY: Brown gravy; chicken gravy; country gravy.

LAMB: Chops; lamb stew with peas.

PORK: Chops with dressing; roast pork; sausage patties.

POULTRY: Creamed chicken; chicken pot pie; turkey loaf; boneless turkey meat roll.

VEAL: Fricassee; veal, beef and macaroni loaf.

MISCELLANEOUS: Ravioli; chili con carne; barbecue sauce; wine sauce.

The Majestic Ice Cream Co., headed by Heber C. Erickson, became the first large-scale customer for these frozen cooked foods and is still serving them in ever-growing volume in its chain of Los Angeles "Malt Shops." "Originally we were unable to serve hot foods in our stores," said Erickson, "because of the prohibitive cost of installing and maintaining kitchen equipment and a kitchren crew. With 'Magic Meals' quick frozen foods we hit a new high in business volume and a new low in operating costs. Customer acceptance was far above our expectations."

This was Erickson's first step into the quick frozen food field. Recently he organized the Pickin' Time Frozen Foods Co. and is now southern California distributor of "Penguin" frozen fruits and vegetables and "Magic Meals."

Striplin, satisfied to leave selling to his associates, still makes production his primary concern. He sticks to his original idea: That frozen cooked foods must make their way primarily on their superior flavor. In the last five years he has developed special recipes for all the "Magic Meals" products, using top-quality ingredients. Through constant experiment and study, he has perfected a freezing process which retains the "fresh-cooked flavor" indefinitely.

The enterprise outgrew the original plant in San Mateo and, in the spring of 1941, moved into its new ultra-modern plant in Pasadena.

Joseph L. Fainer, a well-known attorney and Los Angeles businessman, recently purchased the entire business and plant. California Consumers Corp. built the present plant and produced "Magic Meals" for a time. But Mr. Fainer now owns the plant and the business.

Processing

The plant is a one-story, fire-proof, reinforced-concrete building, with the latest processing and sanitary facilities. It is operated under constant government inspection and meets all government standards. Production is concentrated on one level, with materials moving in a straight-line operation—from raw material receiving rooms to inspection tables, to gas ranges and steam-heated cooking kettles, to packaging machinery, to freezing room.

The products are prepared and cooked as though they were to be served at once. Each ingredient is cooked the correct time for that particular ingredient. This is where the quick freezing process claims a definite advantage over canning. Meat, vegetables, juices, sauces, all keep their full, natural flavor. When cooked, the food is placed in large trays and put in a cooling room kept at about 40 deg. In half an hour to an hour, depending on the product, it is cooled to the packaging temperature of about 70 deg. The filled packages are placed on tray racks and rolled into the quick freezing chamber, equipped with a battery of Peerless plate freezers. Packages are fed into the freezer in rotation, frozen packages being taken out as fresh ones are inserted. The refrigerant, ammonia, reduces the temperature of the freezing plates to 40 deg. below zero. And a fan circulates air through the freezers at a rate of 900 cu.ft. a minute to give a quicker, more uniform freeze. It takes about 2 hours to freeze the products, the freezing time being fairly uniform.

Packaging

The package is a standard Menasha linerless carton—18-point 100 percent bleached sulphite, paraffined. It is oblong, holds 16 oz., has a simplified tear-flap, is leakproof and leaves no paper taste. The problem of expansion, when the foods are frozen, was solved by trial and error. Space is allowed for expansion of each type of food, so it just fills the carton when frozen, without bulging.

The cartons are semi-liquid-proof when the flaps are closed, without sealing—neither end is sealed. The products are of thick consistency when put into the cartons, and there is no oozing. More fluid items, such as soups and sauces, will require different treatment.

Engineers are working to develop a special filling machine. Because the foods are packed after cooling to room temperature they do not run freely nor measure accurately in the ordinary filling equipment. Pending completion of the special machine, filling is being done by hand. Filling is a one-stage operation, the foods being completely mixed, seasoned and cooked before filling.

The foods keep indefinitely at zero temperature, without apparent loss of flavor, color or nutritional values. Samples of quick frozen cooked foods from batches now more than three years old are indistinguishable from new batches.

Distribution Problems

Retail distribution of frozen cooked foods has expanded rapidly into stores with frozen food cabinets. Although the present supply of cabinets is "frozen" by the war priorities, impending restrictions on ice cream may make additional cabinets available for quick frozen foods. Another distribution problem, particularly in the Pacific Coast area, is that frozen food cabinets frequently are operated by the produce department, entirely separate from the grocery store; yet cooked foods are grocery, not produce, items. This has resulted, in many instances, in additional frozen food cabinets being put into grocery sections. Display cards direct customers from the empty canned cooked-food shelves to the frozen food cabinets. Prices run about the same as for the canned products.

What Future Holds

Looking to the future, Fainer officials believe that families who discover quick frozen cooked foods will continue to demand them, even when canned foods again are available in normal quantities. They believe that this new branch of the frozen food industry is here to stay and will hasten the arrival of complete frozen food sections—after the war.

The cooked foods are frozen in a battery of plate freezers. Standing by a freezer are Joseph L. Fainer, owner of Fainer Frozen Foods; William M. Stewart, in charge of sales; and Harvey Striplin, general manager.

After cooling to room temperature the cooked foods are packaged in linerless cartons. Space is allowed for expansion of the foods in freezing, so that the cartons are full but do not bulge after freezing.

Bacteriological Changes In Cucumber Fermentation*

By JOHN L. ETCHELLS, Agricultural Chemical Research Division, USDA, Raleigh, N. C., and IVAN D. JONES, North Carolina Agricultural Experiment Station, Raleigh, N. C.

Research is now being conducted by the authors on brine pickling of vegetables. Any development in this field of food preservation must depend upon an understanding of the bacteriological changes involved. This article presents results of several years' work on the conditions prevailing during the fermentation of cucumbers

BRINE fermentation of cucumbers for salt stock purposes utilizes the selective action of the salt brine on the naturally occurring microorganisms to promote a fermentation resulting in the production of acid.

Using the general commercial salting methods, an acid fermentation commences shortly after cucumbers are brined and continues for from two to six weeks. The initial inoculum for the fermentation comes from the cucumbers and from adhering particles of soil. Salt-tolerant organisms utilize as their nutritive material the soluble constituents that diffuse into the brine as the result of the action of salt on cucumber tissue. They bring about the production of various compounds, chiefly lactic acid, but also acetic acid and alcohols, as well as the evolution of considerable quantities of gas. The formation of these end products was discussed in detail in the January issue of FOOD INDUSTRIES, page 62.

The curing process, requiring about three months, is one of complex bacteriological, chemical and physical changes. Any one of these changes constitutes an adequate basis for considerable fundamental investigation. Such studies would go a long way in placing the pickling industry in the group of scientifically controlled fermentations.

For the past 40 years, research in this field has dealt principally with the bacteriology of the lactic acid fermentation, with a very small proportion of the work being carried out under plant conditions. Little or no attention has been given to the probability that fermentations due to microorganisms other than lactic acid forming bacteria exist and contribute to the general fermentation. The true yeast fermentation which is associated with the general cucumber fermentation was not reported by workers in this field until recently[1, 2]. Similarly, combined bacteriological and chemical studies have demonstrated that still another phase should be included in the fermentation proper[3, 4]. This phase is brought about by a group of gas-producing, salt-tolerant microorganisms belonging to the genus Aerobacter. Such fermentation can be detected easily, because the evolved gas in composed of approximately equal parts of carbon dioxide and hydrogen.

Cooperative investigations were conducted at one of the large pickling plants in Eastern North Carolina from about the middle of June until the last of August. Bacteriological observations reported were made chiefly on fermentations in vats of 85-bu. capacity, salted under outside conditions. The average brine temperature during the fermentation period was about 80 deg. F. Three salting schedules were followed, with initial salt concentrations of 20, 40 and 60 deg. sal. The 20-deg. brine was increased 10 deg. per week for five weeks and the 40-deg. brine, 5 deg. per week for four weeks. The 60-deg. brine was held constant. All brines thus were at 60 deg. after the first month or five weeks of curing. Salting treatments are designated throughout by the initial salt concentrations, expressed in "degrees salometer."

The bacteriological analyses were carried out with respect to populations of acid-forming bacteria, yeasts and hydrogen-producing bacteria belonging to the genus Aerobacter. The methods of examination of brine fermentations with respect to the first two types of organisms have been fully described in previous reports.[1,2] Estimates of the numbers of the Aerobacter group were made by plating known dilutions of the brine on brilliant green agar, as well as by adding serial dilutions of the brine to lauryl-sulphate broth. Comprehensive preliminary studies indicated that the use of differential media was sufficient to obtain a reasonable estimate of the numbers of the Aerobacter group present in brine fermentations.

General Relationships in Fermentations Due to Aerobacter, Acid-forming Bacteria and Yeasts in 20-, 40- and 60-Deg. Brines *

Organisms	Brine conc. (dig. sal.)	General type of fermentation	Fermentation activity	Chief products formed	Approximate start of fermentation**	Approximate duration of fermentation
Aerobacter.....	20	Flash-gaseous	Slight, may be absent	Hydrogen and CO_2	1st day	2–3 days
	40	Gaseous	May or may not be active	Hydrogen and CO_2	1st-3rd day	1 week
	60	Gaseous	Usually active	Hydrogen and CO_2	7th-8th day	1 week
Acid-forming bacteria	20	Acid	Very active	Lactic acid	1st day	3 weeks
	40	Acid	Active	Lactic acid	2nd-3rd day	3 weeks
	60	Acid	Very slight			
Yeasts.....	20	Gaseous	Active	CO_2 and alcohol	3rd-5th day	2 weeks
	40	Gaseous	Active	CO_2 and alcohol	7th day	17 days
	60	Gaseous	Active	CO_2 and alcohol	11th-12th day	17–21 days

* Brine temperature about 80 deg. F. during the fermentation period.
** After heading tanks.

*Presented at the Technical School for Pickle and Kraut Packers at East Lansing, Mich., February, 1942; approved for publication as paper No. 145 of the Journal Series of the North Carolina Agricultural Experiment Station, Agricultural Chemical Research Division Contribution No. 81.

Discussion of Results

The values for the populations of all three types of organisms (Aerobacter, acid-forming bacteria and yeasts) shown in the accompanying chart are plotted logarithmically, principally to facilitate showing counts before and after active fermentation, as well as counts that vary greatly during the active fermentation. Counts less than 1,000 per cubic centimeter are shown below the double line drawn parallel to the abscissa, opposit 1T on the ordinate. Values less than 100 per cubic centimeter are not plotted. Although the fermentation trends for acid-forming bacteria and yeasts are based on duplicate fermentations for two or more seasons, for the Aerobacter group the data represent duplicate fermentations for one season only. This is due principally to the fact that this phase of the fermentation was only recently recognized. However, the results obtained to date give a reasonable indication of their activity in fermentations at the various salt concentrations.

The curves for the three brine concentrations show populations of the Aerobacter, acid-forming bacteria and yeasts at intervals of two days up to about 30 days.

In the 20-deg. brines (those with an initial concentration of 20 deg. sal. increased 10 deg. per week to 60 deg.) the population curve for the Aerobacter group shows that these organisms have a relatively short period of activity, since, after the first two-day interval there was a sharp decline to the 1,000 per cubic centimeter level by the fourth day. The population curve for the acid-forming bacteria rose sharply, so that a peak above the 100 million per cubic centimeter range was reached on the fourth day. The period of marked activity lasted for about two weeks, then the counts declined so as to be within the 1,000 per cubic centimeter range after about three weeks.

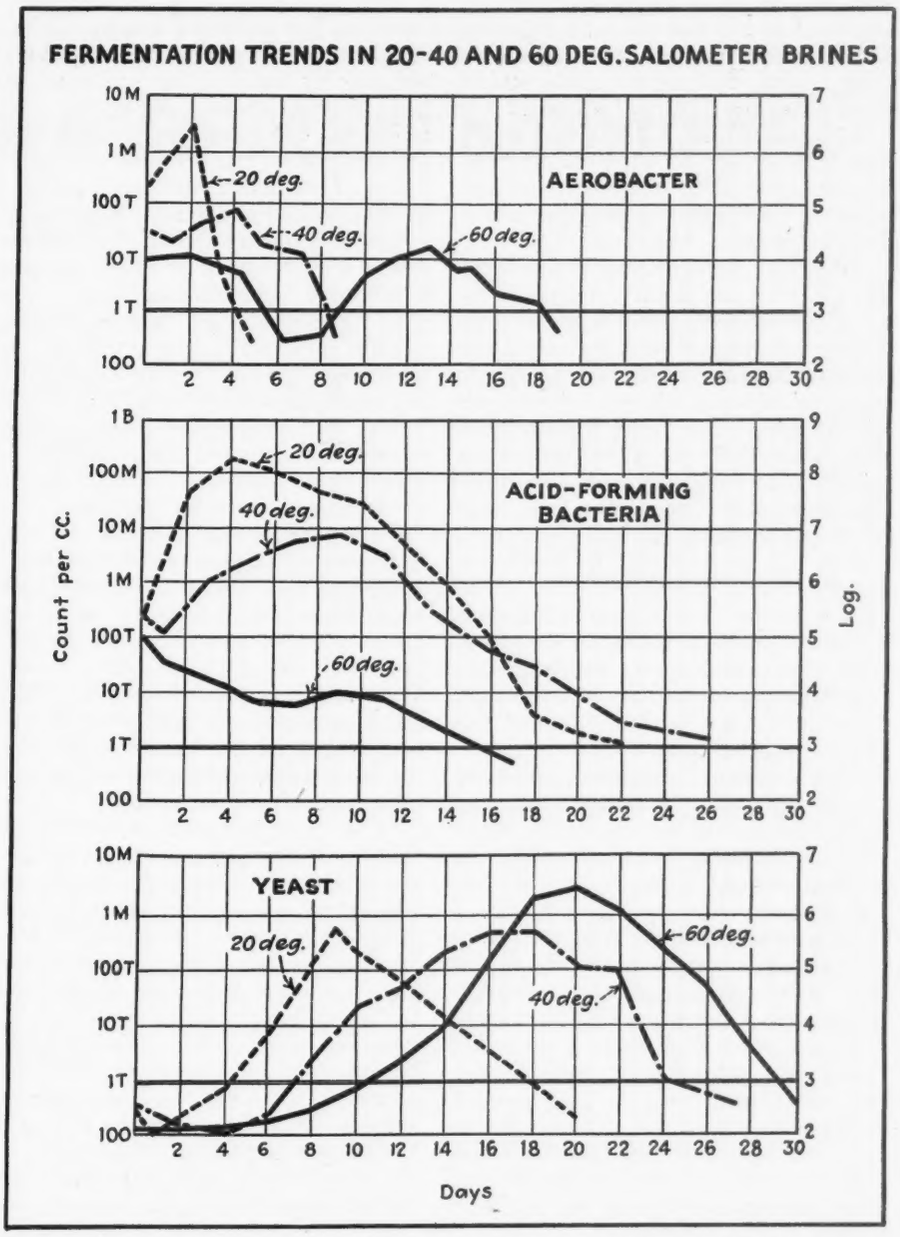
The fermentation trend shows that after a period of relative inactivity for about five days, a typical yeast fermentation occurred, reaching a peak on about the ninth day and then declining so as to reach the 1,000 per cubic centimeter range on about the 18th day. At this time active fermentation was considered to be ended.

With the brines having an initial concentration of 40 deg. sal. (increased 5 deg. per week to 60 deg.) fermentation trends are somewhat different from those for a 20-deg. initial concentration. In the case of the population curve for Aerobacter, it is demonstrated that the fermentation started promptly and covered a relatively active period of about five days, during which time the counts were above the 10,000 per cubic centimeter range. After this time there was a sharp decline to the 1,000 per cubic centimeter range on about the eighth day.

The period of active Aerobacter fermentation corresponds very well with the time required for the acid-forming bacteria to reach the peak of their fermentation. In this instance, the population curve for acid-formers indicates a rather gradual rise to a peak close to the 10 million per cubic centimeter range on about the eighth day. After this the acid fermentaion subsided somewhat gradually, so as to be practically ended after about three weeks.

The yeast fermentation trend shows these organisms initially present in the brine in numbers less than 1,000 per cubic centimeter and remaining in that range for about a week. After this period the counts rose so as to reach a peak well above the 100,000 per cubic centimeter range during the period between the 16th and 18th day. After this the fermentation subsided so that it was practically ended after about 24 days.

The influence of high-salt brines (60-deg.) shows very interesting relationships with regard to the growth of the types of organisms under discussion. The number of Aerobacter present in the brine constantly declined during



Growth of predominating microorganisms in cucumber fermentations at initial brine concentrations of 20, 40 and 60 deg. sal. (percent saturation with respect to salt). The 20-deg. brine was increased 10 deg. per week to 60 deg. and the 40 deg. brine was increased 5 deg. per week to 60 deg.

the first six days. Then, after remaining more or less inactive for a short interval, a fermentation by these organisms ensued, covering an active period from about the 11th to 18th day.

The acid-forming bacteria were markedly inhibited at this salt concentration, as demonstrated by the progressive decline in populations during the examination period.

The yeast fermentation trend shows the effect of salt in the form of an interval of inactivity for about 11 days, during which yeasts were present in the brine in numbers less than 1,000 per cubic centimeter. After this period the counts rose so as to reach a peak above the one million per cubic centimeter range on about the 21st day, then declined so the fermentation was over after approximately one month.

Influencing Factors

Influencing factors that are apparent from the results presented in the curves and other considerations with regard to the three fermentations, based on observations over a period of several seasons, will be discussed.

The 60-deg. treatment probably shows the most consistent behavior with reference to activity of the Aerobacter, resulting in what might be termed a typical hydrogen fermentation. A vigorous hydrogen fermentation is usually encountered. Likewise, with the 40-deg. treatment the typical hydrogen fermentation is common, although frequently with this salting treatment the hydrogen fermentation will take place with only moderate activity. On the other hand, with the 20-deg. treatment the vigorous, prolonged formation of hydrogen generally does not occur. Hydrogen may be detected in the fermentation gases, but only in very low concentration.

The rapid onset of acid fermentation in 20-deg. brines cuts short the activity of the Aerobacter group because these organisms are unable to tolerate the increasing acid content of the brine. This accounts for the presence or absence of hydrogen in fermentations at this concentration. The same explanation will serve in part for the behavior of 40-deg. brines. Here active Aerobacter fermentation appears to be somewhat restricted to brines wherein delayed acid fermentation is encountered or where the predominating acid-forming bacteria are weak acid producers. The initial inoculum provided by the cucumbers in all probability plays a part in directing the course of fermentation.

The influence of salt alone is most clearly demonstrated with respect to acid-forming bacteria. There is a direct correlation between the populations of these organisms and the brine concentration used. Highest populations occur in the 20-deg. brines and correspondingly lower populations at increasing brine concentrations. Also, the fermentation in 20-deg. brines starts earlier. It appears that the activity of the acid-forming bacteria is terminated largely as the result of the combined effect of the brine salt concentration and the concentration of acid developed.

It has been previously demonstrated[5] that the addition of sugar to brines near the conclusion of the acid fermentation brought about no change in the constant decline in the numbers of acid-forming bacteria present. However, if sugar was added at the beginning or during active fermentation, a significant increase in the number of acid-forming bacteria was brought about. This increase in population was not reflected in an increase in acid production.

Comparison of yeast fermentation in the three brines shows that there is a direct correlation between the salt concentration used and the onset of active fermentation. The starting intervals required were about 4, 7, and 11 days, respectively. The duration of the fermentation in 20-deg. brines was somewhat shorter than in the case of 40-deg. brines, although there was no apparent difference in maximum yeast populations once fermentation was under way.

Appearance of a typical vat during the phase of fermentation characterized by a vigorous evolution of gaseous products.

In general the results indicate that yeast fermentation in 60-deg. brines reaches higher maximum numbers than in either of the lower concentrations. The activity of the yeasts is apparently terminated when the sugar in the brine is reduced to a very low concentration or completely utilized. In the experiments involving addition of sugar to brine,[5] the addition of sugar resulted in a marked increase in the yeast population and in the rate of gas evolution.

Some general relationships regarding all the fermentations previously discussed are summarized in the accompanying table. Fermentations with Aerobacter and with yeasts are generally associated with bloater production. Fermentation with the acid-forming bacteria is characterized by preservation of the pickles. This preservative fermentation is active only in the 20- and 40-deg. brines, activity being very slight in 60-deg. brines.

Summary

In general, the bacteriological findings demonstrated that active yeast fermentations were found in all brine treatments used. Active fermentations by the acid-forming bacteria were restricted to the 20- and 40-deg. brines. General observations revealed that an active hydrogen fermentation by the Aerobacter group was usually encountered in 60-deg. brines, while in the 40-deg. brines an active hydrogen fermentation may or many not take place. A relatively short fermentation by this group of organisms may occur in 20-deg. brines or it may be absent.

Acknowledgement

The authors wish to express appreciation to Chas. F. Cates and Sons, Inc., of Faison, N. C., and The Mount Olive Pickle Co., Mount Olive, N. C., for active cooperation in the studies reported.

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British Food Technologists Improvise To Meet Shortages

By H. B. CRONSHAW, Surrey, England.

Manufacturers of frozen desserts kept on making products acceptable to consumers even though the "essential" ingredients were denied them. This story of making bricks without straw has a point for food technologists in this country

THE order by the British Ministry of Food prohibiting manufacture and sale of ice cream and water ices after September 30th, 1942—because of the urgent need for economy in manpower, transport, raw materials and materials for packing—ended the ice cream industry's three year struggle for existence. This struggle had gone on in the face of enormous difficulties created by the shortage or complete absence of ingredients required in the manufacture of ice cream. Milk, cream, milk powder and milk solids generally were prohibited in December, 1940, and at different times cuts were made in butter and other fats, along with sugar and other sweetening agents. So in 1942, before the prohibition order, no manufacturer was able to secure more than 60 percent of his normal requirements of fat, 40 percent of sugar and little, if any, of the various substitutes and other materials which had come into use. And yet the industry managed to maintain its output of war time "ice cream" which, although somewhat inferior to the normal article, was eagerly consumed by the public.

The industry is very largely made up of small units, and not more than half a dozen firms have their own chemist. Early in the war the industry pooled its technical resources through a joint war emergency committee of its two associations. Chief credit for organization goes to the committee's secretary and engineer, P. K. MacKenzie.

Under the direction of the associations' technical advisers, E. R. Humphries and L. R. M. Feltham, the problems were tackled as they arose, and recommendations were distributed by direct mail and through the technical journals. In this way the associations kept their members well informed with regard to current difficulties, despite the kaleidoscopic changes in the supply situation and the restricted resources in equipment and technical ability of the great majority of manufacturers. As a further help to the industry, the joint war emergency committee in March, 1941, issued a small book, compiled by Feltham and Humphries, containing formulas and technical instructions. In April, 1942, a revised edition was published.

Frozen Custard

Broadly speaking, two types of product were made in Britain, ice cream proper and "custard ice." The latter has or rather had, a particularly good sale in Scotland.

Prewar frozen custards contained about 3 to 4 percent of fat and were made from milk, sugar and corn flour, sometimes with the addition of eggs. The corn flour was made into a thin paste with cold milk. The remaining milk was heated to the boiling point, the sugar was dissolved in it, and then it was added to the corn-flour paste while stirring. The mixture was heated until it thickened and then was passed through a sieve, cooled, flavored and frozen. Unlike ordinary ice cream, the custard type was not aged and hardened, and was consumed within 12 hours of manufacture as it did not keep well in storage.

Normally, corn flour was used in the amount of 3 percent of the total mix weight, and this proportion was maintained in the war time formula when supplies were available. In cases of shortage, wheat flour had to be mixed with the corn flour, using 4 parts of the former to 3 parts of the latter. There were occasions on which the whole of the corn flour had to be replaced by wheat flour.

However, the big problem was to find a substitute for the milk and at the same time make both ends meet with less sugar. All supplies of cow's milk and milk products, margarine and other fats were cut off from this section of the industry. Sugar did not present the same difficulty as milk, and the public had to make the best of a product containing about 10 percent of sugar in place of the usual 13 percent.

One way of overcoming the milk difficulty was to use goat's milk. But it was not long before the associations' experts had another answer to this puzzle. If not cow's milk, why not vegetable milk? So a high-grade soya flour took the place of milk and was found to work quite satisfactorily. Above all, there was no great shortage of supplies.

There was, however, one point that had to be taken into consideration. If more than 3 percent of the mix weight is soya flour, a characteristic taste is imparted to the product, although to many people the nutty flavor is not objectionable. With soya flour alone, 8 percent of the mix weight is required, but this can be halved by incorporating 5 percent of wheat flour into the formula.

An important point is that when wheat flour is used in this way the mix becomes excessively viscous unless the wheat starch is degraded. Malt extract was used to convert the starch into dextrine and maltose by the enzymatic action of malt diastase. The total solids content can then be raised without unduly raising the viscosity. The action proceeds best at 140 to 150 deg. F. At temperatures above 175 deg. F. the diastase is destroyed. The diastatic activity of the malt extract, measured by its Lintner value, has to be taken into consideration in determining the particular amount to be added.

By using wheat flour to replace part of the soya flour, the total solids may be raised to about 25 percent. The method is as follows. The wheat flour, say 10 oz., is first made into a thin, smooth paste with cold water. To this, 2 oz. of malt extract diluted with water is added and the temperature of the mixture slowly raised to 150 deg. F., where it is held for 20

(*Turn to page 116*)

Courtesy Factory

Hose is not made to be walked upon, so don't leave it in the aisle.

Courtesy Factory

The way not to turn off hose. Sharp bends reduce its life.

How To Stretch Life of Rubber

Here are several practical pointers that will enable you to get more months of service from tires, hose, belts and gloves*

WHEN the monkeys from Nippon took over the rubber trees of the Far East and gained control of nearly all the world's natural supply, much attention was paid to means of conserving rubber and taking care of products made of it. But since then careless predictions about the production of synthetic rubber have caused some to feel that there is not much cause for worry. So a little pessimism is in order—enough, at least, to see the situation as it really is. The monkeys still hold the rubber trees, and synthetic production isn't going to meet our demands for many months to come. So men in industry can have no claim to intelligent management unless they adhere rigidly to a program of conserving everything made of rubber.

It is the purpose of this article to bring to your attention—at the risk of repeating something you may have heard before—some facts about the life of things made of rubber and to outline fundamental precautions which should be taken in the use of such equipment.

The Enemies of Rubber

First, let's line up the enemies of rubber and learn to recognize them at sight. At the head of the line is plain, ordinary carelessness on the part of employees—doing such things as shutting off the water by forming a sharp bend in the hose, stepping on hose, running plant trucks over it or pulling it across sharp or rough objects. In the operation of motor vehicles—the greatest use of rubber in the food industries—carelessness takes the form of scraping tire walls against curbs, pulling over curbs, quick starting and stopping and failure to check tire inflation at least once a week.

Next to carelessness as an enemy of rubber comes oil or grease—substances with a petroleum or vegetable-oil content. Where rubber is used in plant equipment—as part of a machine, or as belts or conveyors—care should be taken to keep lubricating oils and grease from coming in contact with it. Keep the grease in the bearings where it will do some good and don't let it work out or slop over onto belts, electric insulation and what not. By the same token, where possible keep grease off the floors so that rubber-tired industrial trucks do not pass through it and the hose used in cleaning isn't dragged over it.

Because of the nature of their operations, many food plants have a certain amount of fats and oils on the floors and equipment, and in these plants hose used for washup service should itself be washed daily to remove any fats and oils from the outside covering. Rubber gloves, too, should be washed with soap and water to remove any grease or dirt before they are carefully hung up at the end of a day's work.

Another major enemy of rubber is sunlight. It deteriorates rubber rapidly and is a frequent cause of breakdowns. So hose, belts, tires and what not should be protected from the rays of the sun as much as possible. And don't hang rubber gloves and other rubber apparel where they will be exposed to sunlight.

Strange as it may seem, rubber is not completely waterproof. And when hose or belting is constantly wet, it will gradually absorb some of the moisture, with damage to the cotton reinforcement. When water hose is not in use it should be drained to prevent moisture from penetrating the fabric. With fire hose, the standpipe valve should be checked at intervals to prevent leakage of water into the hose.

Abrasion, as everyone knows, grinds away rubber, yet it is easy to overlook possibilities for cutting down frictional wear by checking all equipment over which rubber travels or which it touches. Perhaps the greatest loss of

*The facts about conserving rubber upon which this article is based are from B. F. Goodrich Co. sources.

rubber through abrasion in the food industries comes from driving motor vehicles too fast on the turns. Drivers should be careful not to leave rubber on the pavement when they drive around a curve.

Heavy loads damage rubber, as they do everything else. In the food industries this occurs especially in truck operations, and it is well to remember that a 20 percent overload reduces tire life to 70 percent of normal; a 40 percent overload to 51 percent of normal. Your tire dealer can tell you how much load the tires on your vehicles should carry, if you don't already know. The tires on industrial trucks used about the plant can be overloaded, too, as can conveyors and transmission belts.

Excessive heat or cold is destructive of rubber, especially excessive heat. And here again the motor vehicle enters the picture in a big way in the food field. In this connection, it should be noted that it is not weather so much as the wear and tear that brings tire temperatures to a dangerous level. High operating speeds, heavy loads and underinflation are what makes tires get too hot. One test showed that, with a 3,700-lb. load and an operating speed of 45 miles an hour, the tire temperature went up 11 deg. for a 400-lb. load increase and 31 deg. for an 800-lb. increase. Incidentally, tires of cotton construction operating for sustained periods at 240 to 250 deg. F. will fail. Speed, of course, also greatly affects tire temperature. For example, under one given set of conditions the tire temperature was 180 deg. at 30 miles an hour but reached the danger point of 240 deg. at 57 miles an hour. So trucks should be kept rolling—but slowly.

Constant tension causes rubber to deteriorate more rapidly than if it is at rest. A water hose closed at the end and constantly full of water at high pressure will have only a fraction of the life of a hose used intermittently.

Constant bending and flexing also shortens the life of rubber products, especially those not designed for such service.

Do's and Don'ts for Tires

Because of the large amount of rubber used in the tires of motor-vehicle fleets in the food industries, management should pay particular attention to the care of tires. Many factors affect tire life, and it is suggested that those in charge of truck operations get a booklet on the care of tires from a tire manufacturer or dealer. But by way of providing a summary of practical rules for longer tire life, the following do's and don'ts are listed:

1. Never overload your tires.
2. Inflate tires at least weekly, more often if possible, to the recommended pressure. Check air pressure after a few miles of service whenever a tire is changed. It is estimated that three-quarters of all tire troubles are due to improper inflation.
3. Investigate sudden drops in air pressure—check for leaks.
4. Do not "bleed" out air when the pressure has risen above normal in a hot tire, for it develops still greater heat in the casing.
5. See that dual tires are properly mated, and put worn tires on inside and newer tires on outside wheels.
6. Never use a boot or blowout patch in a good tire except for a short emergency. Tires that could be successfully repaired if taken out of service in time are ruined by boots.
7. Replace broken or bent rims or lock rings.
8. Never let the tube valve touch a brake drum, as it will carry drum heat directly to the tube.
9. Be certain that the proper size flap is used for the tire and rim size used.
10. Never fasten chains on wheels too tightly, as it decreases both tire life and traction.
11. Don't let gasoline or oil come in contact with tires or tubes.
12. Avoid quick starts and stops.
13. Make sure wheels are always in alignment to avoid uneven and rapid tire wear.
14. Avoid scraping tires against curbs, for this may break or weaken the cord fabric and eventually result in a blowout.
15. Slow down for the curves and keep the rubber on the tires instead of leaving it on the road. Taking corners at high speed wears tires faster than anything else.
16. If a car or truck begins to steer queerly, the driver should stop and inspect the tires for underflation.
17. Don't drive too fast on hot, dry roads. High speed heats the tires and hastens deterioration and wear.

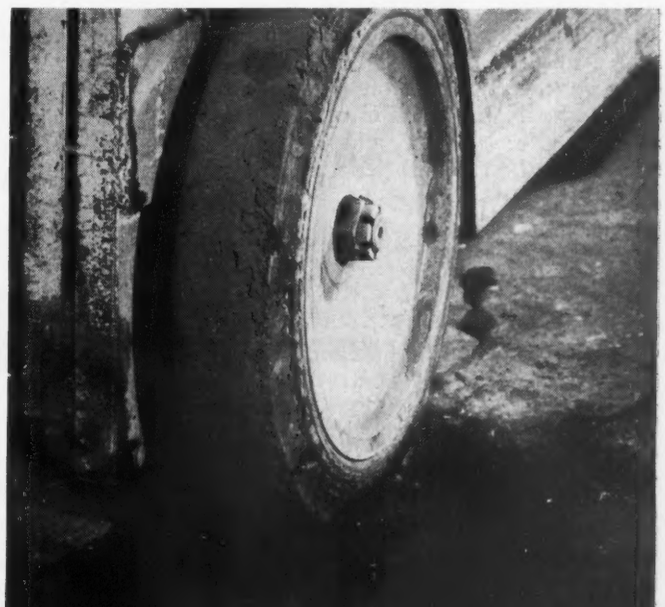
Hints for the Plant Man

In addition to the precautions cited in discussing the enemies of rubber, there are a few practical suggestions that ought to be made about the use in the factory of things made of rubber:

Do not use higher water, steam or air-hose pressures than those recom-

Courtesy Factory

It seems unnecessary to point out that it doesn't help hose to drive an industrial truck over it, yet it sometimes happens.



Courtesy Factory

Truck should not be parked in a pool of oil or grease, nor even run through oil or grease.

Rubber hose is widely used in food plants for cleaning operations, and when moved over greasy floors the hose itself should be washed after using.

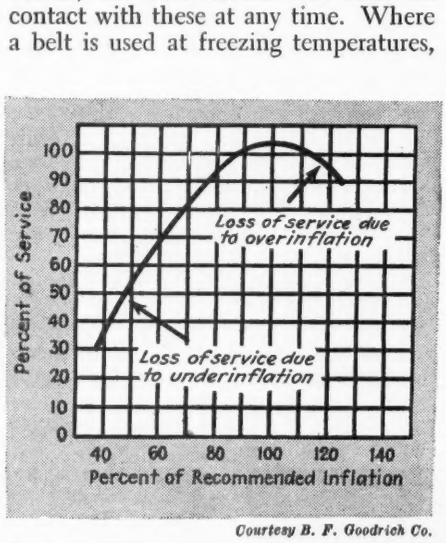
mended by the manufacturer. And if a hose must be used under excessive pressure, avoid constant use. Periodic use for short intervals will give longer life. The connection of hose to a valve should be so made that the hose hangs down—a bend near the coupling, with the weight of the hose putting tension on the rubber, will shorten the life of the hose.

In using steam hose, one end of the hose should be kept open while the steam pressure is turned off, as quick condensation may cause the tube to pull away from the carcass. Also it should be remembered that hose with one end open will stand a higher pressure than when both ends are closed. Another point is that saturated steam is less damaging to hose than superheated steam.

To get the maximum life out of fire hose it should be stored in racks with as few folds as possible, and the position should be changed periodically to relieve the strain on the rubber tube at the same points. It is also well to run water through unused fire hose periodically to retard oxidation of the lining. The hose should be drained and dried thoroughly afterward.

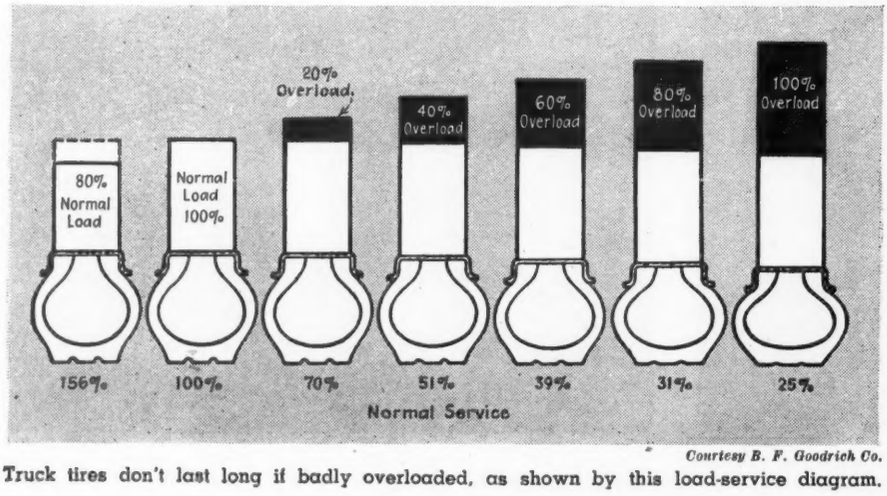
As protection to the rubber tires of industrial trucks, it is advisable to see that floor-washing solutions do not contain oils, as tires subjected to oils become soft and spongy.

Where rubber conveyor belts are used in a plant, particular attention should be paid to the condition and spacing of the idlers, because wear along the straightaway is negligible on such belts if the idlers are right. The principal wear on a conveyor usually comes at the loading point, and an ideal loading chute feeds material onto the belt in the direction the belt is moving and at as near the speed of the belt as possible. Excessive wear on belts is sometimes caused by rubbing against the skirt boards; the belt should not come in contact with these at any time. Where a belt is used at freezing temperatures, care should be taken that the belt does not freeze to the pulleys when stopped. The rubber may be torn away when the belt starts.



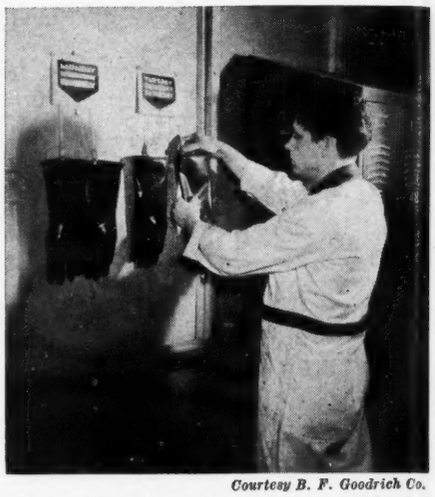
Courtesy B. F. Goodrich Co.

Underinflation causes more excessive tire wear than anything else, and overinflation is bad, too. This chart shows the effect of inflation on tire mileage.



Courtesy B. F. Goodrich Co.

Truck tires don't last long if badly overloaded, as shown by this load-service diagram.



Courtesy B. F. Goodrich Co.

When taken off, rubber gloves should be washed and carefully hung up to dry. And their life is increased if two pairs are used, so as to give each a rest.

V-belts are widely used to transmit power in food plants, and to avoid excessive wear the pulley sheaves must be accurately aligned and the sheaves clean and free of harmful burrs. Belt tension, of course, ought not to be either too tight or too loose, either with V-belts or flat belts.

Rubber gloves, boots, and other articles of apparel should be cleaned of oils, greases and other natural enemies of rubber after they have been used. Employ luke warm water and a good grade of soap, rinse off all the soap after cleaning, and hang the article up to dry. An employee should have two pairs of rubber gloves, as one pair worn continuously will wear out much more quickly, relatively, than if given a rest period of 24 hours between wearings. Gloves and other rubber articles should be stored in a cool, dry place away from sunlight. In removing light-weight rubber gloves, they should not be pulled off by the finger tips like leather or cloth gloves but should be "peeled" off inside out. The gloves create a suction effect when the fingertips are pulled and may snap off at finger ends. It is also good practice to dust the inside of rubber gloves with talcum each time they are removed. Perspiration clings to the gloves and will tend to make the inside walls tacky if the moisture is not dried promptly.

The time will no doubt come when synthetic rubber will relieve the rubber shortage—some say in 1944—but meanwhile anything made of rubber is a precious article to be given the care due an irreplaceable valuable.

Getting the Most Miles Out of Truck Tires

Seabrook Farms sets up three-card system to cover life of every individual tire in large truck fleet at New Jersey vegetable quick freezing and dehydration plant

THE value of the old proverb, "Watch the pennies and the dollars will take care of themselves," is well exemplified in the tire conservation system of Seabrook Farms, Bridgeton, N.J., in which every individual tire used by the truck fleet is watched from date of purchase to permanent removal when unfit for further service.

When the utmost in service is obtained from each individual tire, the total requirements of any truck fleet can be reduced to the minimum, a vital necessity in these critical days of rubber shortage.

There is nothing new in the Seabrook Farms system of getting the most out of the tires required for its motor fleet by watching each individual tire. Many of the larger truck fleets in the food field have used it for years, not to conserve the available rubber supply, but to reduce the cost of tires as an important factor in obtaining the minimum motorized transportation or distribution expense.

Therefore, the necessity to conserve tires in the present war emergency may prove a long-time boon to fleet users in the food field by forcing them now to indirectly obtain the lowest tire cost per mile by a system which is just as good in peace as it is in wartime. Hence, the present critical need for tire conservation should prove of value to food-field truck users for many years to come.

The motorized transportation operations of Seabrook Farms were described in detail in FOOD INDUSTRIES, January, 1942. It and the Deerfield Packing Corp. are said to be the world's largest motorized truck farm, with a fleet of 237 motorized units. These include farm tractors of all sizes, giant vining machines and eight diesel tractor- trailer units with refrigerated bodies.

The Seabrook Farms tire system was established by A. A. Kuehn, director of transportation for the company. It consists in part of three cards, all of which are reproduced on these pages.

We say that the system consists "in part" of three cards because these cards only provide the records of the mileage rendered by the individual tires, whether this mileage is low or high as measured by the conditions under which the tires are used. The cards only tell whether the record is good or bad.

From that point on, really the most important part of the Seabrook Farms system or any other similar system is the operating procedure which will insure the record being good instead of bad on each individual tire. If this is done, it is like "watching the pennies" and leaving "the dollars to take care of themselves" in the form of lowest total tire expense and tire cost per mile.

To begin at the beginning, when a Seabrook Farms tire is purchased, it is assigned a brand number and this number is burned into the side wall of the tire. This brand number, together with other detailed information covering the tire, is then entered on the 5x8-in. tire record card reproduced herewith.

The other detailed tire information should include the price paid for the tire; its make, type, serial number, size and number of plies; and the date received.

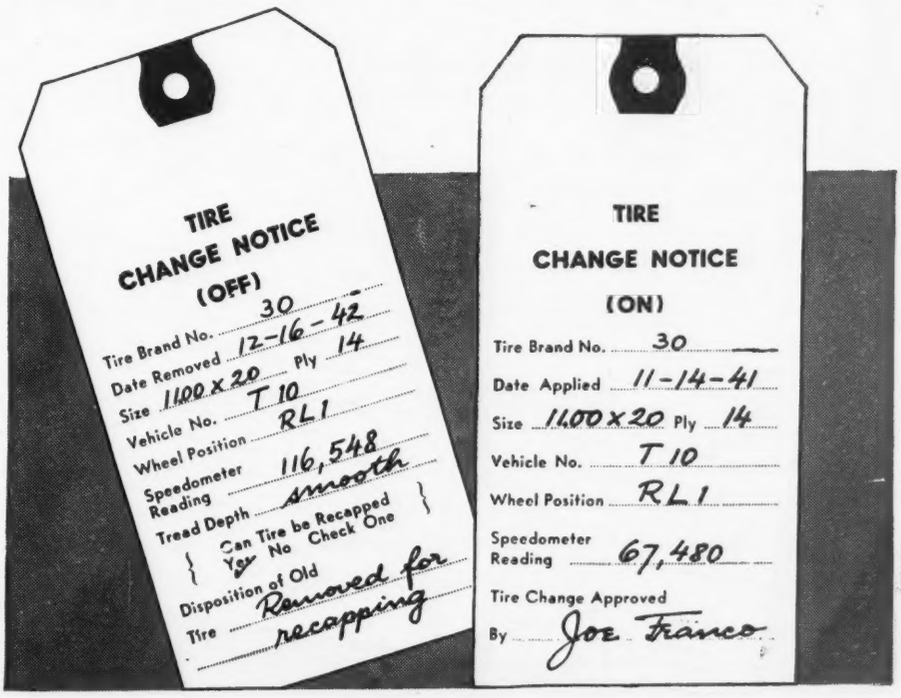
The brand number, with some other letters, such as *SB*, burned into the tire side wall, can serve as ownership identification of the tire throughout its life and especially when removed and sent to outside tire shops for repairs or recapping.

The chief benefit of the brand number, however, is to facilitate record keeping. Since brand numbers run consecutively, a maximum of four-digit numbers on any individual tire is sufficient to cover a total of 9,999 tires.

It is much easier to write down four such digits than it is ten similar digits as represented by a serial number such as F135681498 as shown on the card reproduced herewith. Besides, the brand numbers, being burned into the tire wall to a greater depth than the serial numbers, are much less liable to be scuffed off in service and the identity of the tire thus lost.

The tire record card, thus properly filled out, may be inserted in a file box, and the total of such cards represents the stock of new tires on hand. If the cards are grouped by size in the file box, this subdivision will give the number of new tires of the different sizes on hand and at any given time.

When a new tire is removed from stock, the tire change notice (*on*) tag,



"On" and "off" tire change notice tags by means of which the starting and finishing speedometer readings are obtained on the Seabrook Farms trucks to determine the actual tire mileage delivered between changes. The "on" tag is printed in blue ink and the "off" tag in red so that they will not be misused.

also reproduced herewith, is filled out by the man mounting the tire and the tag returned to the person maintaining the tire records. The data on the tag is transferred to the corresponding tire record card and the particular tire is thus officially off on its life's run.

At this time, the tire record card may be removed from the stock file box or stock file subdivision and put into or behind a "tires in use" subdivision and thus provide a record of the number of tires in actual service at any given time.

Whenever a tire is removed from a wheel in service for any reason, the tire change notice (*off*) tag is filled out and a second tire change notice (*on*) is made out for the tire replacing the one removed. Both tags are returned to the person in charge of the tire record system.

In the case of the tire change notice (*off*) tag, the date on the tag is transferred to the corresponding tire record card. By subtracting from the *off* speedometer reading the speedometer reading when the tire was previously mounted, the mileage actually run between changes is obtained.

The total of all such mileages until the tire is finally removed and junked when unfit for further use gives the total mileage run over the life of the tire.

Experience tells what mileage a given size of tire running under average conditions of overload and road speed should deliver. When a junked tire has failed to deliver that anticipated mileage, there is usually something the matter.

If it is due to a defect in the tire, that may be corrected by adjustment with the tire supplier. If it is due to faulty care or careless operation, nothing can be done about it except to pay the bill in the form of excessive tire expense.

To prevent tire waste due to carelessness, A. A. Kuehn has set up certain operating rules. Once the tires are properly mounted, and matched in case of duals, the responsibility for the proper care of the tires on any vehicle is placed on the driver of that vehicle. He must first of all see that all his tires are properly inflated every day—not every week or month, but every day.

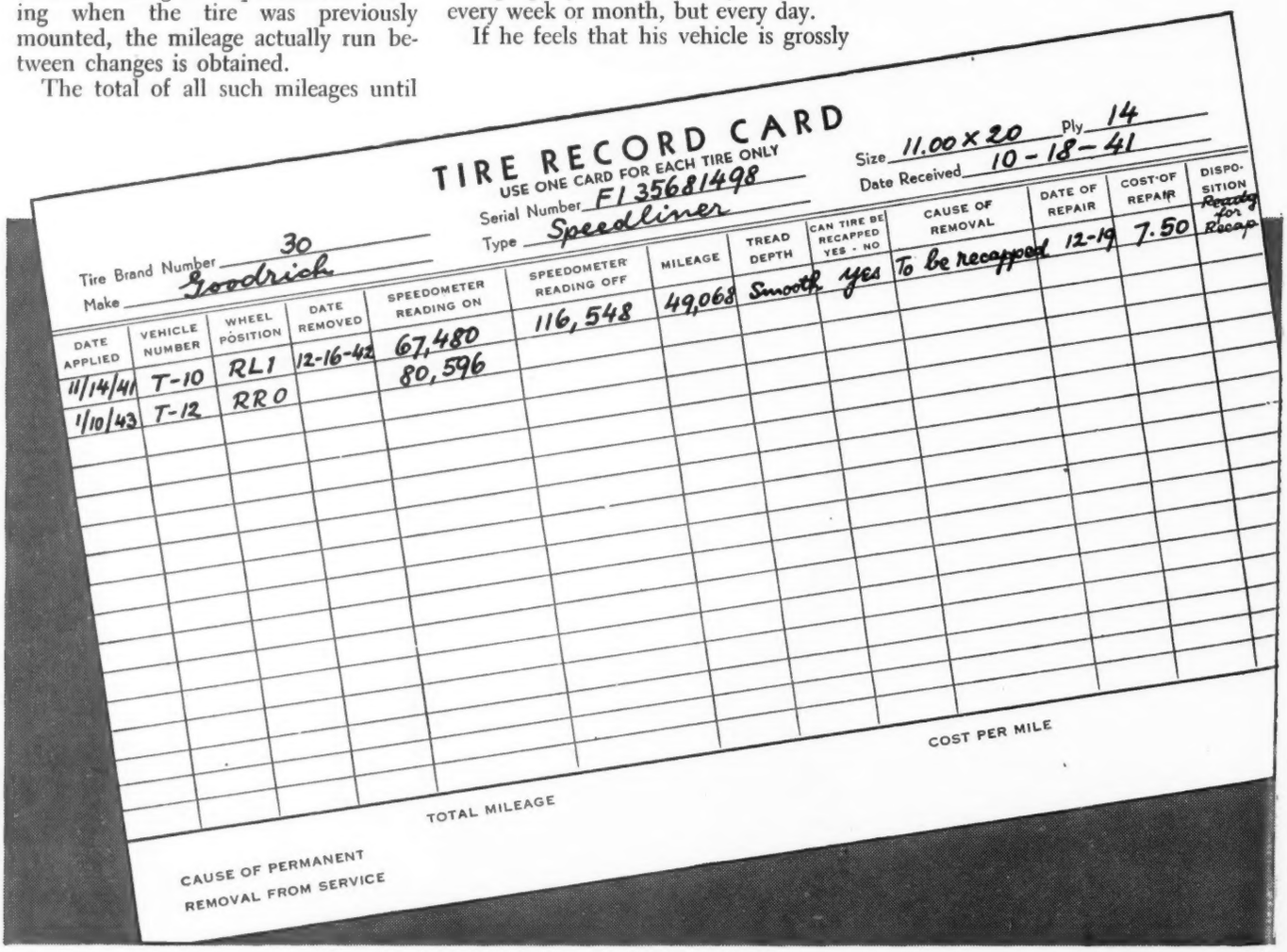
If he feels that his vehicle is grossly overloaded, he should call this to the attention of the chief loader. In driving he should avoid excessive speed and sudden stops which grind rubber off the tread.

Running over broken bottles and hitting curbs at high speed are two other "don'ts."

Also, in appealing to each driver to take care of his tires as a patriotic duty to help win the war, Mr. Kuehn has yet to find one driver who will not agree to cooperate wholeheartedly.

Tire Inspection Postponed

JOSEPH B. EASTMAN, director of ODT, on January 12 postponed the final date for initial commercial motor vehicle tire inspections, as required by General Order ODT No. 21, from January 15 to February 28. After the initial inspection, the vehicles must be presented for regular inspection every 60 days or every 5,000 miles, whichever occurs first.



TIRE RECORD CARD

USE ONE CARD FOR EACH TIRE ONLY

Tire Brand Number 30 — Make Goodrich — Serial Number FI 35681498 — Type Speedliner — Size 11.00 x 20 — Ply 14 — Date Received 10-18-41

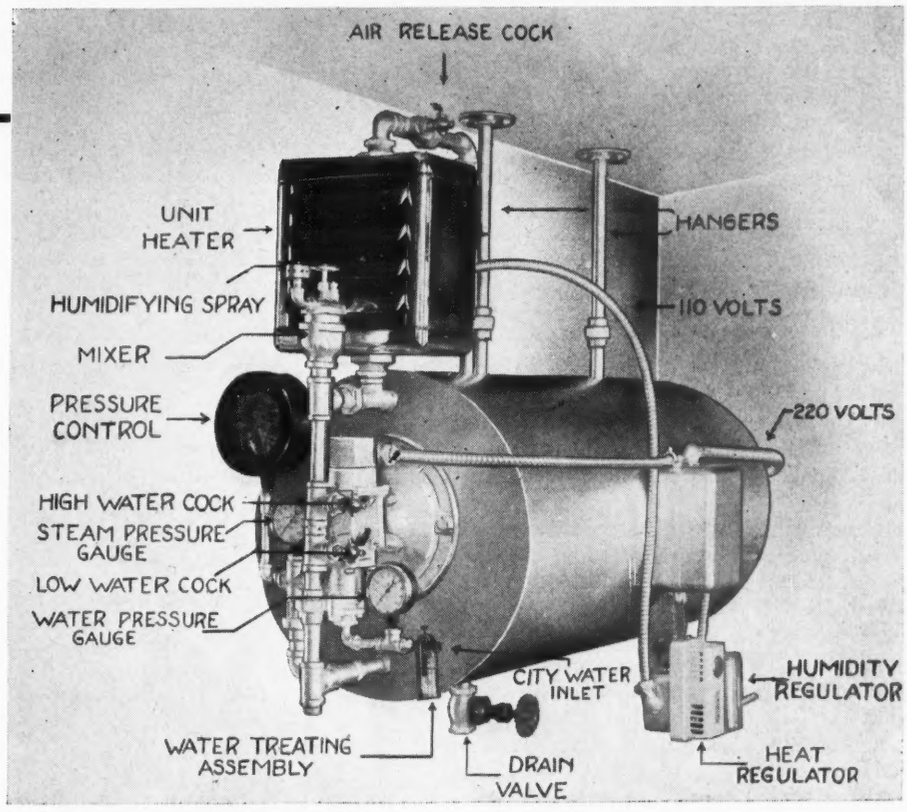
DATE APPLIED	VEHICLE NUMBER	WHEEL POSITION	DATE REMOVED	SPEEDOMETER READING ON	SPEEDOMETER READING OFF	MILEAGE	TREAD DEPTH	CAN TIRE BE RECAPPED YES - NO	CAUSE OF REMOVAL	DATE OF REPAIR	COST OF REPAIR	DISPOSITION
11/14/41	T-10	RL1	12-16-42	67,480	116,548	49,068	Smooth	yes	To be recapped	12-19	7.50	Ready for Recap
1/10/43	T-12	RRO		80,596								

TOTAL MILEAGE — COST PER MILE

CAUSE OF PERMANENT REMOVAL FROM SERVICE

Reproduction of the 5x8-in. tire record card by means of which Seabrook Farms, Bridgeton, N. J., keeps an accurate record of the mileage delivered by each individual tire. Each Seabrook Farms driver is held responsible for the proper care of the tires on his vehicle as his patriotic duty to conserve rubber to help win the war. The actual record of a once-removed tire which was recapped and put back into service, and is still in service, is shown on the card.

FOOD DRYING and PACKING
Where No Steam Is Available



• **WE OFFER complete units for generating steam and rapid circulation of hot dry air, for quick drying of products and reduction of relative humidity in packing rooms.**

Place unit adjacent to drying cabinet and also in packing room. Attach to 220 or 440 volt electricity and city water.

COMPLETE AUTOMATIC CONTROL. NO ENGINEER OR ATTENDANT REQUIRED.

Units are licensed for use on annual royalty payment. Royalties paid are deductible from income before taxes. Pay as you go and save at least 50% of the cost of equipment if it were purchased.

DUAL FLASH for HUMIDIFYING and DEHUMIDIFYING

A completely assembled electric fired boiler operating at 75 pounds steam pressure. Automatic controls regulate room humidity or temperature. Rapid circulation of air by unit heater fan moistens or dries product quickly as desired. No engineer or attendant required. Automatic in operation and control.

STEAMAIRE COMPANY

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Dehydration of Vegetables ··· Carrots

STEPS in the dehydration of all vegetables are similar, but the equipment needed will vary considerably with the product being processed and will also be influenced by the type of dehydrater used and the type of container in which the finished product is packed.

What these steps are is well illustrated by the vegetable dehydration line recently installed in the plant of Beech-Nut Packing Co., at Rochester, N. Y. This installation is suited to processing such vegetables as beets and carrots and the accompanying flow diagram and pictures show the operation on carrots.

Carrots enter the plant at the unloading dock in field boxes, which are piled on hand-operated lift trucks and taken by freight elevator to the fifth floor of the manufacturing building. Here, the carrots go either directly to process or are stored in a cool room at 50 deg. F. until needed for processing.

Washing to remove field dirt is the first step, here carried out by water sprays directed at the carrots while they are tumbled in a rotating, perforated cylinder.

From this first washing operation, the carrots move by gravity chute to one of two flame peelers. In flame peeling, the vegetables are exposed for a few seconds, while passing through a refractory-lined rotating cylinder, to a flame temperature of 2,100 deg. F. This chars the thin outer layer of skin, which is then removed by high-pressure water sprays in specially constructed washers.

From the washers, the peeled carrots move to two trimming and inspecting belts, where workers remove the tops and trim out any irregularities or unpeeled portions. The next step is a final wash, and then the carrots move to the dicer or slicer.

After dicing, the carrots are placed in circular blanching trays and weighed. Four of these trays are placed in a retort basket, and two filled baskets are then placed into a retort. These retorts are regular vertical canning retorts, equipped with time-temperature controllers, and in them the carrots receive a six-minute blanch at 240 deg. F. steam temperature.

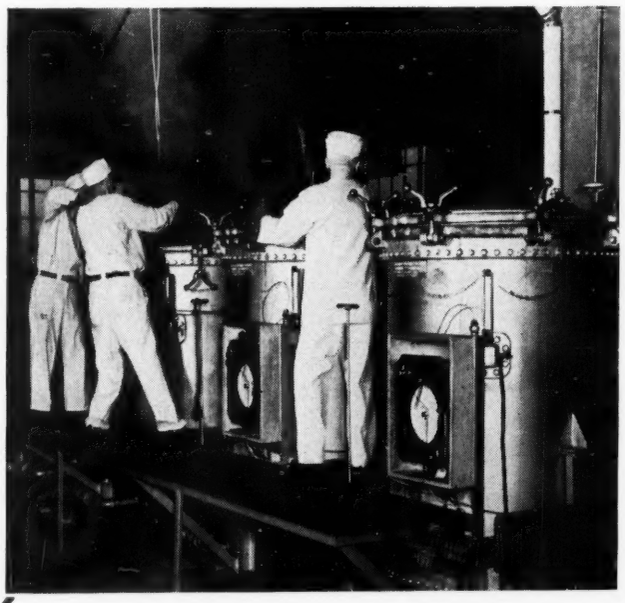
After blanching, the material is conveyed to a spreader belt, which spreads it on trays at the rate of 1.5 lb. per square foot. Forty of these filled trays are loaded onto one truck, and the filled truck is then pushed into the tunnel dehydrater.

Dehydration down to around 7 percent residual moisture is accomplished in a center-exhaust tunnel holding 25 trucks, in about 4.5 hours. Then the partially dehydrated carrots are removed from the trays and conveyed to the equalizing bins, where final dehydration to below 6 percent final moisture is accomplished by 18 to 24 hours' exposure to a slow current of low-humidity air at 135 deg. F.

From these bins, the product moves to a final-inspection belt, thence over a magnetic separator into 5-gal. tins (the standard U. S. Army pack). Filled cans then have the air exhausted, are filled with inert gas, and the lid is affixed in a double seamer. After code-stamping and labeling, the product is ready for shipment.

FOOD INDUSTRIES
February, 1943
Pages 64-67

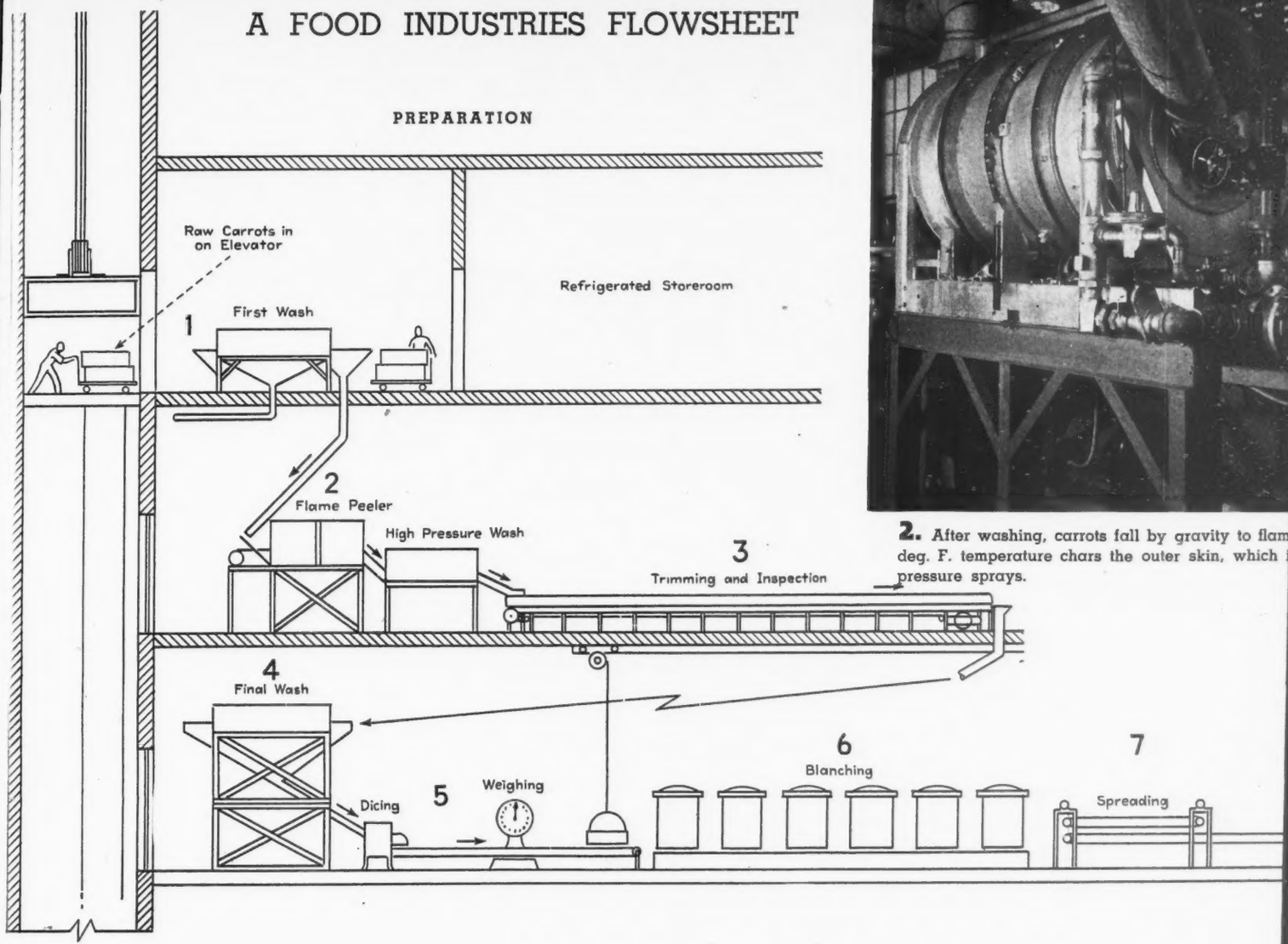
1. Carrots, delivered in field boxes, are dumped into a washer where field dirt, stalks and leaves are removed by water sprays as the vegetables tumble in a rotating, perforated cylinder.



6. Blanching is carried out in vertical canning retorts, each holding two baskets of four trays. This process, under automatic control, blanches the product for 6 minutes with 240-deg. steam.

7. After blanching, carrots are conveyed to and placed on the spreading belt which serves to feed them evenly to the line of empty dehydrating trays shown on the lower line of conveyor.

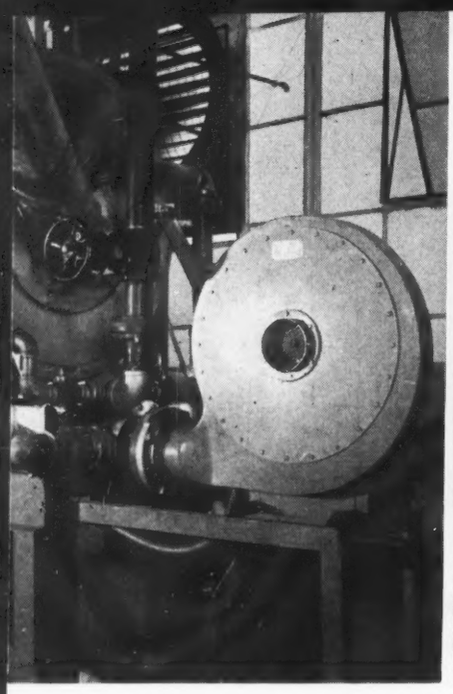
A FOOD INDUSTRIES FLOWSHEET



2. After washing, carrots fall by gravity to flam
deg. F. temperature chars the outer skin, which i
pressure sprays.

8. Trays, filled by the spreading belt, are evened off by the girl with the rake, at right center, then loaded into rack trucks by the two men at left of the picture, forty trays being placed on each truck, twenty to a tier, making a load of about 600 lb. of raw material per truck.

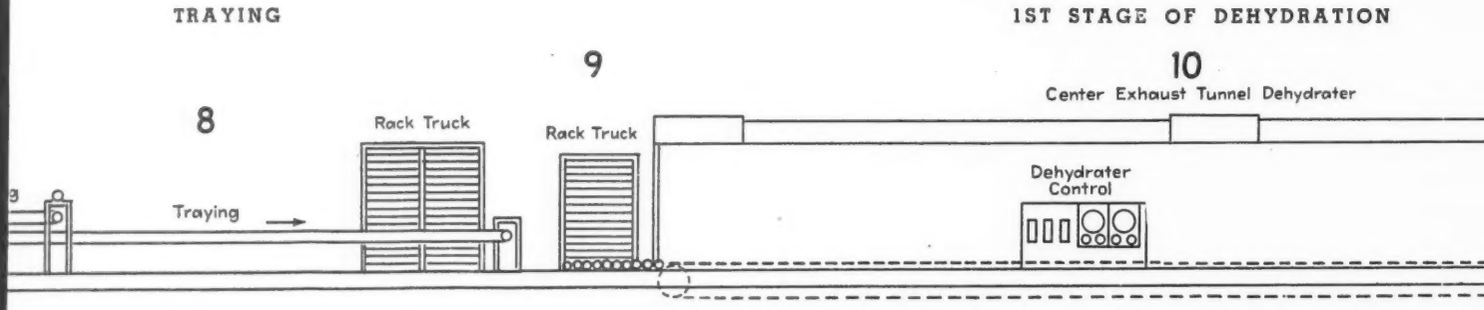
9. Loaded trucks enter del
shown at back of truck liftin
closed so that heated air in



gravity to flame peelers. Here a 2,100-
er skin, which is then removed by high-

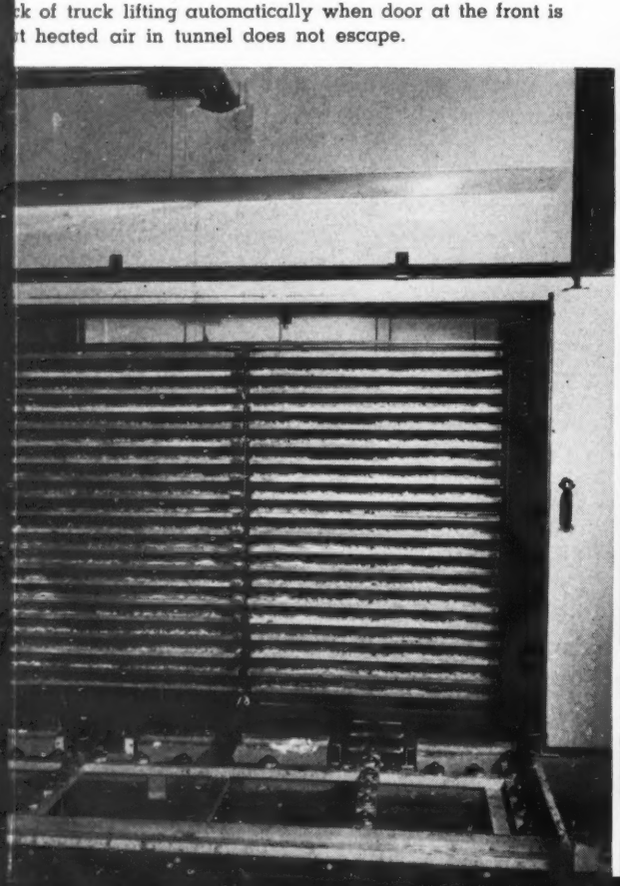
3. Upon leaving the peelers, carrots pass to one of the two trimming and inspection belts where the tops and root ends are trimmed off and the product inspected for imperfections.

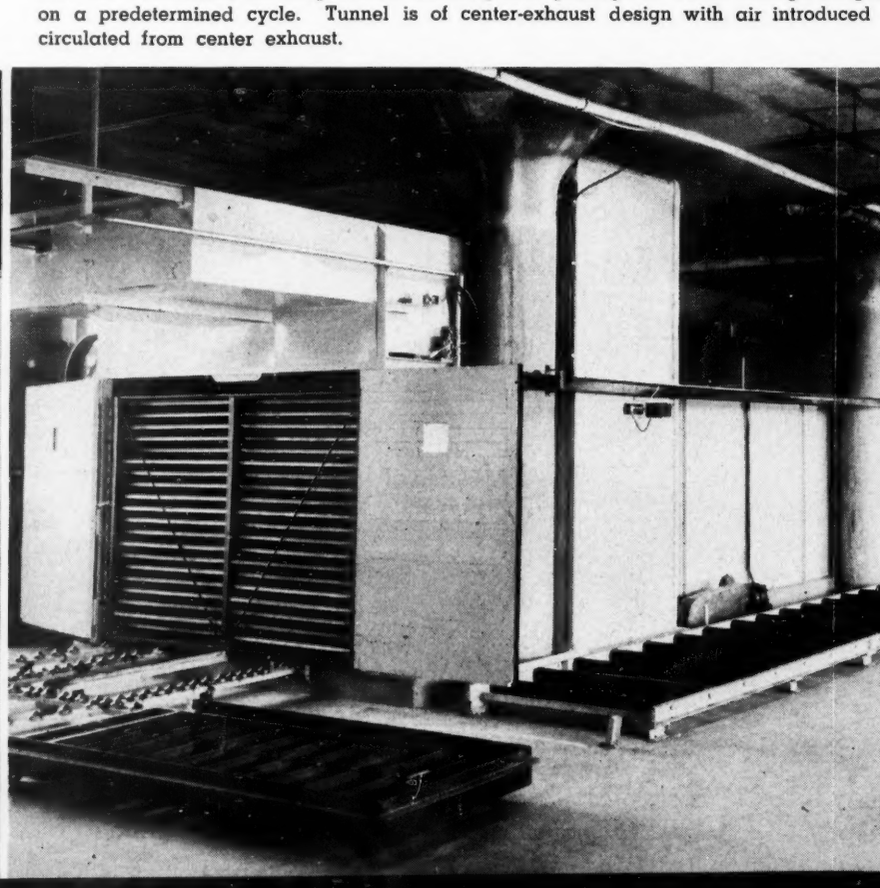
4. When trimmin
to a chute leading
similar to the wash

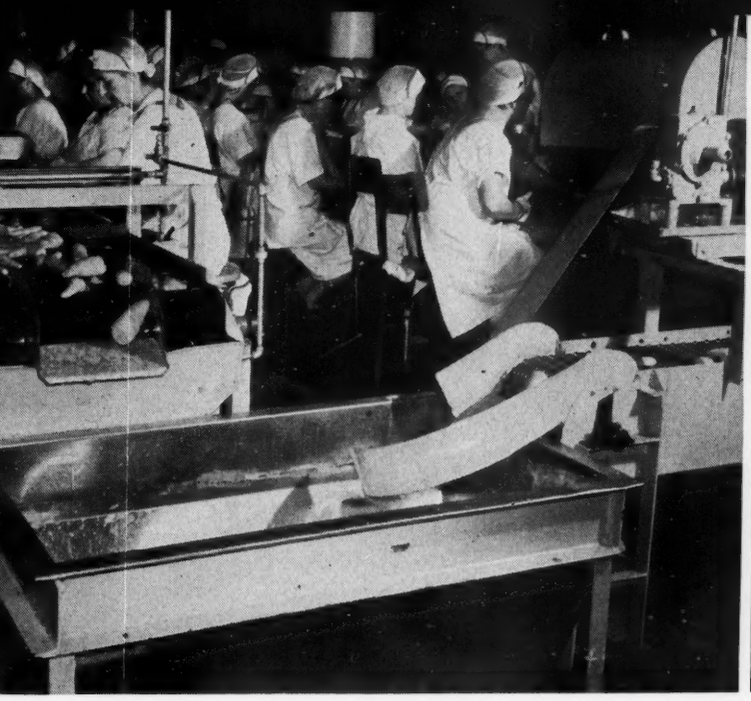


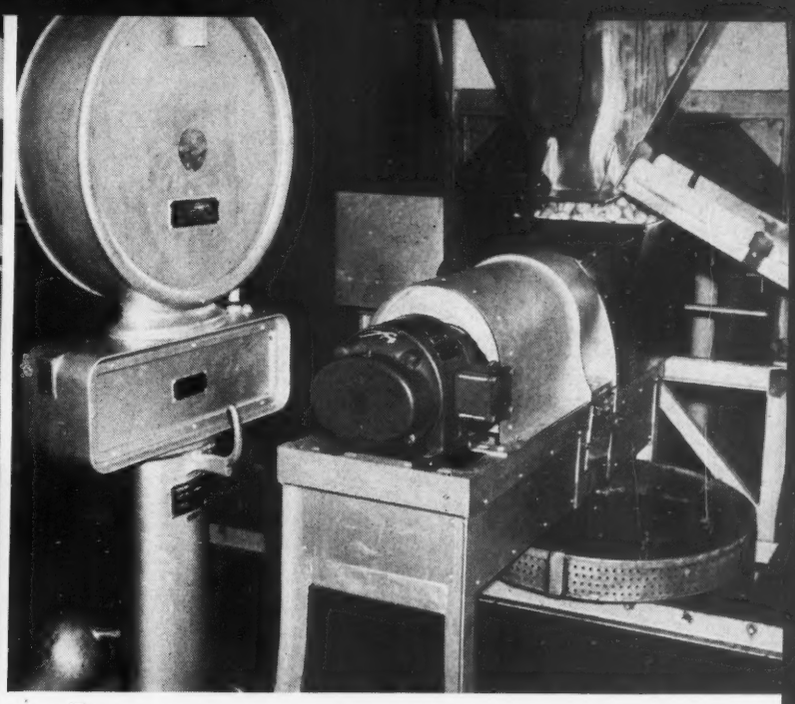
rucks enter dehydrater through an air lock, with door
k of truck lifting automatically when door at the front is
t heated air in tunnel does not escape.

10. Air circulation, air temperature, humidity and passage of trucks through dehyd
on a predetermined cycle. Tunnel is of center-exhaust design with air introduced
circulated from center exhaust.









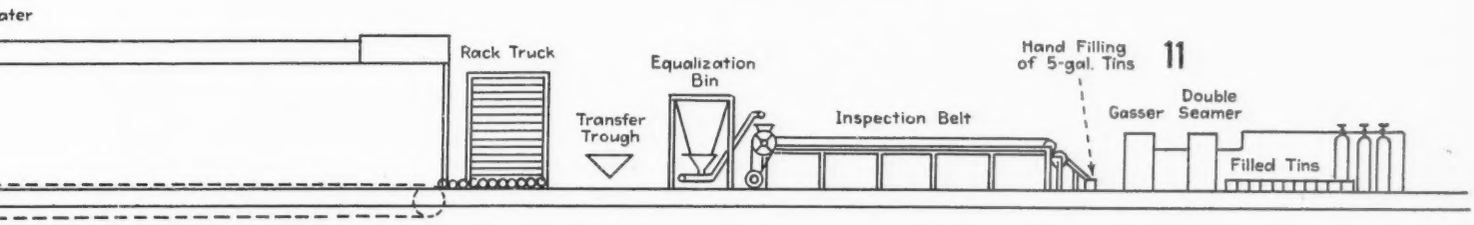
5. From the final washer, carrots go to the dicer, which in turn delivers them to shallow, circular blanching trays, then the trays are weighed and four are placed in a retort basket.

▪ When trimming and inspection are completed, carrots are conveyed a chute leading to the floor below, where they enter another washer nilar to the washer shown in Fig. 1.

ATION

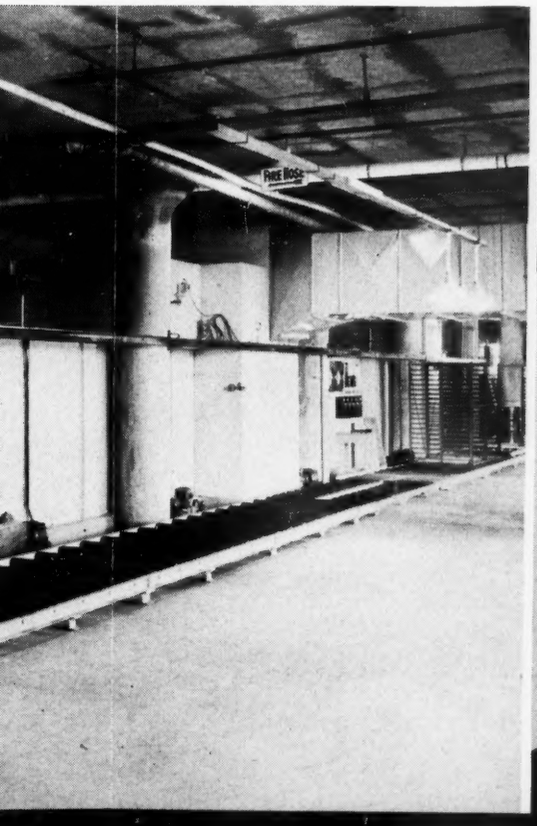
2ND STAGE OF DEHYDRATION

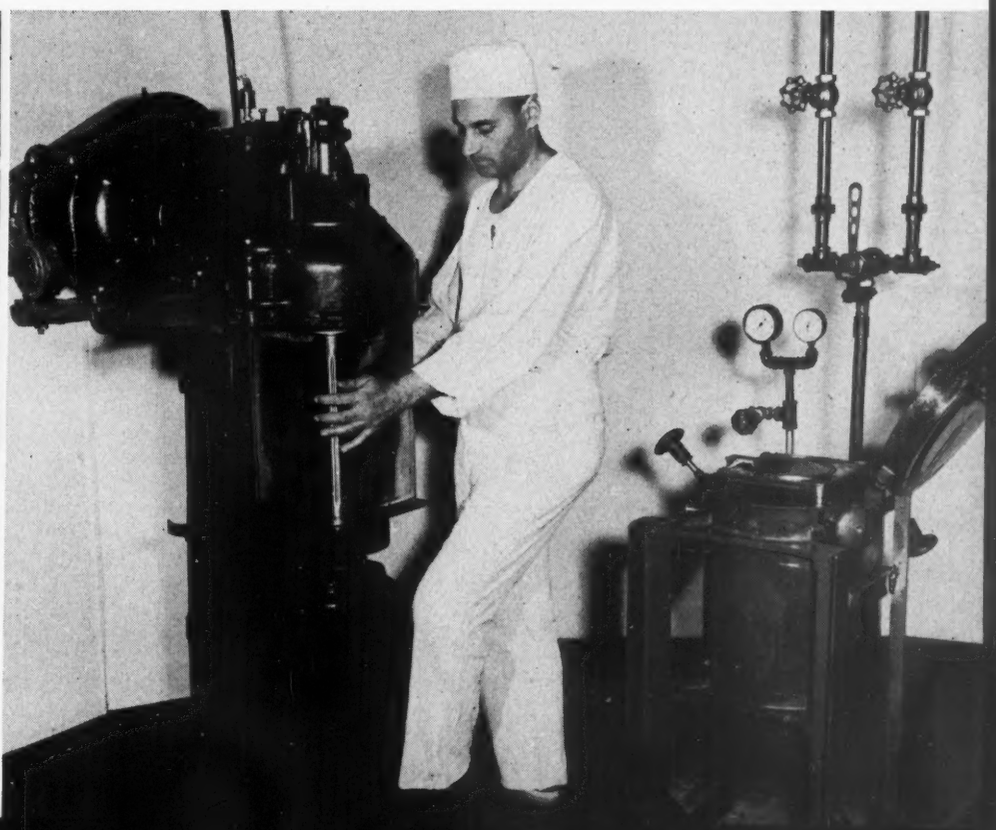
PACKAGING



s through dehydrater are automatically controlled air introduced at each end, and part of air re-

11. Filled cans of dehydrated carrots, with can lids loosely in position, are first exhausted, then filled with inert gas in machine at right, after which the lid is fastened on in the double seamer shown at left.





How ALCO Solenoid Valves

May Help You Solve a Manpower Problem

In these days of labor shortages, it is possible that many valves and controls in your plant, now operated manually, could be opened and closed *automatically* with Alco Solenoid Valves. You are assured of dependable, accurate performance with a definite saving in manpower or man-hours.

Alco Solenoid Valves are electrically operated valves drawing 8 to 15 watts when open. They close automatically under pressure. They are designed to control the flow of water, air, light oils, steam, or any liquids which will not attack bronze, steel, or stainless steel. For refrigeration systems, they are furnished for Freon, Methyl Chloride, Brine, and Ammonia.

They are responsive to and may be operated by thermostats, pressure switches, float switches, timers, or remote electrical switches.

Mechanical features include screwed, flange, or solder types—for standard or special voltages—manual opening stems—3/8" to 2" connections—designed for pressures up to 200 lbs.—approved by Underwriters' Laboratories.

Due to mandatory Wartime restrictions, Alco Solenoid Valves are available with high preference ratings only. Alco Valve Company, for many years the leader in the field of refrigerant controls, invites you to send your control problems to our research laboratories. Write for free Bulletins No.'s 173-174 on Solenoid Valves, or No. 17C for information on our complete line of Refrigerant Controls.

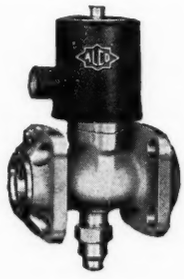
TYPE S1

TYPE S2

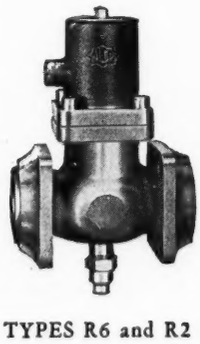
TYPE M6

TYPE M3

TYPE R3



TYPE R1



TYPES R6 and R2

ALCO VALVE COMPANY • 2642 Big Bend Blvd., St. Louis, Missouri

The advantages of Pittsburgh Glass in food dehydration

TODAY, one of the oldest materials in the world is playing an important part in developing one of the world's newest industries.

Consider these advantages of Pittsburgh Glass in the dehydration of foods:

1. STRENGTH AND TOUGHNESS.

The Pittsburgh process of Herculiting, or tempering, makes either plate glass or Carrara Structural Glass four times as strong and flexible as ordinary glass of equal thickness, many times as resistant to shock and impact.

2. IMPERVIOUSNESS.

Pittsburgh Glass is absolutely immune to the attacks of practically all food acids, fumes and chemicals. Glass duct-work, tank linings, trays and the like are therefore permanent. Corrosion is eliminated.

3. SANITATION.

The imperviousness of glass makes it highly sanitary, a factor of prime importance in food dehydrating equipment.

4. THERMAL QUALITIES.

Herculited Pittsburgh Glass can withstand constant operating temperatures up to 650°F. And it can withstand equally well any sudden temperature variations involved in food processing.

5. TRANSPARENCY OR OPACITY.

Tempered Pittsburgh Glass is available in either style to suit your needs.

6. VARIETY OF SHAPES AND FORMS.

Pittsburgh Glass can be fabricated into bent shapes, pierced disks, narrow strips, flat plates for tank linings, etc. And you can get glass in a wide range of thicknesses.

7. AVAILABILITY.

There is no shortage of glass as there is of many critical materials used for the same purposes. It is immediately available. Pittsburgh Plate Glass Company can assure speedy delivery anywhere in the country.

. . .

Why not allow one of our technical men to discuss with you the application of this practical, permanent material to your food dehydrating equipment or plant? No obligation involved. Merely write Pittsburgh Plate Glass Company 2029-3 Grant Building, Pittsburgh, Pennsylvania.

PITTSBURGH PLATE GLASS COMPANY

"PITTSBURGH" stands for Quality Glass and Paint

If you plan to

DEHYDRATE or QUICK FREEZE

Consult KERBY SAUNDERS *First!*

DEHYDRATION
AIR-CONDITIONING REFRIGERATION

DON'T repeat mistakes already made by others who have pioneered the way. Kerby Saunders, Inc. engineers will bring you the benefit of the best methods already in use; they can help you avoid costly mistakes and save *time*, which is the essence of the whole food program for 1943.

• Our Engineering Staff is thoroughly experienced in designing, building, and equipping complete plants or additions, for all types of Dehydration and Quick Freezing — for efficient and *profitable* production.

Because Dehydration and Refrigeration involve the same principles of the proper control and utilization of temperature, humidity and air flow, a complete knowledge of both is essential to the fullest exploitation of either.

We are now building air-conditioning installations which are among the largest ever built. Our experience in air conditioning and refrigeration has covered a wide range of products. Quick freezing, especially, is an old story to us.

We are thoroughly conversant with all the problems of dehydration and are prepared to take on assignments from food manufacturers who are about to embark in this field. This service includes not just the actual construction of the plant, but a field study and complete recommendation— beginning with the source and variety of raw materials—right through to the packaging and storing of the finished product.

Write or Wire—

KERBY SAUNDERS, Inc.

330 West 42nd. Street, New York City

ENGINEERS and CONTRACTORS

Dehydration • Refrigeration • Air Conditioning

Army Specifications For Dehydrated Foods

Tentative specifications for dehydrated foods have been issued by the Quartermaster Corps. A list of Army requirements for dehydrated vegetables appeared in "Food Industries" in November, 1942, and January, 1943. Specifications for other dehydrated products are published here

KNOWLEDGE of exact Army specifications for dehydrated foods is necessary information for those already dehydrating products for government use as well as for those planning to enter the field. In the tentative specifications below, packaging requirements in each case are given after the description of product specifications.

Soup Mixtures—Dehydrated, Powdered, Pastes

The following specifications form a part of the requirements for dehydrated soup mixtures:

Tentative Specification C-M-351—milk, dry, powdered; skimmed and whole.

Federal Specification SS-S-31—salt, table.

Federal Specification EE-S-571—soda, baking.

Tentative U. S. Army Specification No. 22-42, "Supplies, Subsistence, for the United States Army, Conditions Governing the Purchase of."

U. S. Army Specifications No. 100-2, "Standard Specifications for Marking Shipments."

Quartermaster Corps Tentative Specification, OQMG No. 12-A, "Packing for Overseas Shipments."

General Requirements

Soup mixtures shall be procured as either vitamin-fortified or nonfortified, as may be directed in the invitation for bids. If a nonfortified soup mixture is specified in the invitation for bids, all references to vitamin B complex concentrate or concentrated dehydrated extract of brewer's yeast shall be eliminated from the specification. Nonfortified vegetable soup mixtures shall be prepared from ingredients in the same relative proportion as presently specified with the omission of vitamin B complex concentrate.

Soups, dehydrated, powdered and pastes, shall be such of the following types as may be specified in the invitation for bids:

Type I, vegetable soup, dehydrated. Type II, yellow pea soup, (*a*) plain, (*b*) curried. Type III, green pea soup. Type IV, bean soup, (*a*) navy bean, (*b*) other types of soup (lima, pinto, pink, etc., as may be specified in the invitation for bids). Type V, cream of tomato soup. Type VI, soup paste, chicken flavored, (*a*) 25 percent chicken fat, (*b*) 25 percent hydrogenated vegetable oil.

Preparation

Dehydrated, powdered soup mixtures and soup pastes shall be prepared under modern sanitary conditions and in accordance with best commercial practice, from clean, sound vegetables of proper maturity.

All deliveries shall conform, in every respect, to the provisions of the Federal Food, Drug, and Cosmetic Act, and regulations promulgated thereunder. Powdered soup mixtures, exclusive of Type I, shall be so precooked as to permit proper preparation by boiling in water at 212 deg. F. for three minutes or less. The finished product shall be free from bitter, musty, rancid and other undesirable flavors and odors, and shall contain no materials other than those normally found in such a product. The spice component may consist of dry spices or their essential oils, or suitable equivalents. The finished products shall not form agglomerates when mixed with water under conditions stated above. The dehydrated or powdered soup, when prepared according to directions, shall be of good thick consistency and shall simulate in flavor, odor and color the product which it represents. The salt used shall comply with Federal Specification SS-S-31 type A. The dry, powdered, skimmed milk shall comply with Federal Specification C-M-351.

Detail Requirements

The moisture content for Types I and V shall not exceed 7 percent by weight. The moisture content for Types II, III and IV shall not exceed 9 percent by weight. The moisture content for Type VI shall not exceed 1 percent by weight.

Concentrated dehydrated extract of brewer's yeast.—One gram of this powder shall contain the water and/or alcohol extractable vitamin B complex factors of at least 4 grams of dried brewer's yeast, and the final potency per gram shall be not less than 600 micrograms of vitamin B_1, 180 micrograms of vitamin B_2, 175 micrograms of vitamin B_6, 800 micrograms of pantothenic acid, 2,000 micrograms of niacin, plus all of the other factors of the vitamin B complex as extracted from brewer's yeast under the conditions noted above. The vitamin B complex concentrate, referred to in Types I, II, III and IV dehydrated soups, shall be in the form of a powder.

Type I, vegetable soup, dehydrated, shall be composed of the following named vegetables and other ingredients in the proportion by weight indicated. The dehydrated vegetables used shall be of prime quality.

Vegetable	Proportion (Percent)
Pearl barley	14.00
Green pea (steel cut)	9.50
Yellow pea (steel cut)	14.75
Rice	11.50
Tomato (powdered and/or flaked)	17.80
Carrots (flaked)	6.50
Onion flakes	4.75
Parsley	0.50
Dextrose	5.5
Salt	3.8
Monosodium glutamate and/or suitable flavor accentuating amino acids	5.75
Black pepper	0.08
Marjoram	0.035
Allspice	0.035
Tricalcium phosphate	0.50
Vitamin B complex concentrate	5.00

Type II, yellow pea soup, shall contain 3.33 percent vitamin B complex concentrate, and not less than 80 percent, by weight, shall be yellow pea. Type III, green pea soup, shall contain 3.33 percent vitamin B complex concentrate, and not less than 80 percent, by weight, shall be green pea. Type IV, bean soup, shall contain 3.33 percent vitamin B complex concentrate and not less than 80 percent, by weight, shall be the bean referred to on the label.

All soups, exclusive of Type I, vegetable, dehydrated; Type V, cream of tomato; and Type VI, soup paste, chicken flavored, shall cook up into a smooth puree, free of granular particles when prepared according to directions and substantially free of agglomerates. In case the puree does lump, it shall be rejected if more than 50 percent, by weight, of the dry powder passes a No. 120 U. S. Bureau of Standards screen when subjected to 5 minutes agitation in any standard mechanical screening device. Not less than 80 percent, by weight, of the product shall be the type of bean or pea represented by the mixture.

Type V, cream of tomato soup, shall be prepared from sound, ripe, fully-matured red tomatoes, powdered skimmed milk, added carbohydrates and suitable flavoring materials. The tomato product used in the powdered soup shall not contain proportionately more skins than were present on the original fresh tomatoes. The powdered product shall contain not less than 50 percent, by weight, of tomato solids; not less than 5 percent, by weight, of skimmed milk solids; and not more than 45 percent, by weight, of added carbohydrates, salt and condiments. The proportions shall be computed on a moisture-free basis. The sodium bicarbonate shall comply with Federal Specification EE-S-571 for baking soda, and shall be added only to the extent necessary to eliminate curdling in the finished liquid soup.

Type VI, soup paste, chicken flavored. (*a*) Shall be made in accordance with the following: Not less than 25 percent, by weight, of pure chicken fat, free from rancidity and prepared under strictly sanitary conditions. Not less than 10 percent, by weight, of commercial monosodium glu-

(*Turn to page 125*)

Where To Locate That Dehydration Plant

By L. V. BURTON, Editor of "Food Industries."

Government officials regard a correct location as the most pressing problem for newcomers to solve when entering the dehydration field. The main question is where to get enough of raw materials of the proper quality to justify going into a new business. But there are many other problems.

PREVIOUS experience in food processing is a great help in operating a dehydration plant where vegetables are the raw materials, but previous experience in other fields gives little help in choosing the right location. Even vegetable canners who have the advantage over all other newcomers are up against something new in the conversion of their plants from customary processes and raw materials to the dehydration process and production of the goods the government wants.

Here are some of the problems to be solved in locating a new plant:

1. Raw materials that, when cooked, are well known on the dinner table but are not old friends of the average food processor, especially from the procurement aspect.

2. Operating 24 hours a day. Few food plants that are primary food processors have ever operated continuously as a matter of normal policy. Yet it appears that a successful vegetable dehydration plant must run continuously or else lose money.

3. Procurement of sufficient high grade help to run continuously. This is difficult during the war. And it becomes doubly difficult because the crops in greatest demand in dehydrated form today are root crops that also require much labor for cultivation and harvest, and usually war plants are fairly close by that pay much higher wages.

4. Difficulty of picking up a plant and moving elsewhere in case an error of judgment has been made. This is a serious problem because a dehydration plant of economic size is a large one, as food preservation plants go. If tunnel dryers are used and are built of ordinary building materials, the courts in certain jurisdictions have construed that they are permanent improvements on the property and, therefore, not legally removable. This becomes a problem only where rents on leased property and notes on equipment are in default.

5. Water supply. Paradoxically, it takes a lot of water to get rid of water by dehydration.

6. Waste disposal. This problem has licked several dehydrators already. Wastes are both solid materials (garbage to the general public) and liquid wastes (sewage) that canners understand but few others think about.

7. Smell. The little matter of odor is *something*, especially where onions are being dehydrated. The fragrant aroma of boiling onions when a Thanksgiving feast is cooking is not the proper simile for the overpowering reek of strong onions undergoing dehydration. It will "perfume" the atmosphere for miles around, and 72 hours of it are generally sufficient to start the anvil chorus. After a few weeks the law is usually invoked unless onion dehydration plants are way outside the city limits.

8. Supervision is not to be overlooked. A plant located hundreds of miles from the main office had better be well staffed with technical brains—men who can walk alone. The bright young man that many food manufacturers like to put in charge of distant plants too often lacks even a nodding acquaintance with the fundamental sciences or food technology involved. This is not to disparage the bright young man but to direct attention to the fact that dehydration is not a standardized process today.

Furthermore there is no one place to go to buy the equipment for a complete new large plant for vegetable dehydration. This is quite the reverse of the case of a firm which wants to enter such fields as meat packing, dairying, baking, ice cream manufacture, carbonated beverage production, or flour milling. In all these branches of the food industry there are equipment firms all ready and waiting to set the newcomer up in business if his credit is good. And usually the equipment company will lend the services of someone to supply the know-how.

9. Prevailing temperatures and humidities. High temperatures and humidities augment the problem of dehydration in hot air and have been known to prevent production of satisfactory quality.

Each of the foregoing nine problems has an important bearing on where to locate a new vegetable dehydration plant. But there are many other problems, such as power supply, oil or fuel supply, gas, boilers, transportation, yard space, hard surfaced highways, housing for help, ability to keep the plant warm in winter, transportation of help from town to outlying plants, storage for raw materials and storage for finished goods. Probably there are several more, but the problems last mentioned are general problems, common to almost any sort of manufacturing plant that even a promoter seeking to capitalize on his hopes would think about.

Before going on to discuss some of the major problems, let me state that in an experience of some 35 years in, or associated with, food processing I have had several occasions to help locate a new food plant. And not once have I ever known a place that was chosen because it was 100 percent perfect. Maybe the 100 percent localities exist, but all that I have ever heard of have been a compromise based on the existence of the indispensable features plus a fair degree of the noncritical ones. The nine numbered features given at the outset seem to be indispensable location factors for success in a dehydration enterprise.

The Case of the Varnish Maker

While the government authorities are doing their utmost to bring about a conversion of food processors of other types to dehydration, there are many

outsiders who are trying to get into the field, many of whom are motivated by patriotic service, not always by promoter's profits.

Take the case of the varnish maker who has a battery of vacuum shelf dryers, once used for drying shellac. War has cut off his raw material supply and now he wants to convert his shellac department to vegetable dehydration. Having had no previous experience with perishable foods, it was his thought that potatoes, for example, could be prepared in Maine and shipped to his plant for dehydration. Problems of blackening or spoilage had never entered his thinking, astute business man though he was. When he learned that he would be getting into the food business in a plant where varnish odors might not enhance the edibility of his food, and where a large amount of dirt, waste and slop must be handled, his enthusiasm quickly changed. Instead of it being an easy conversion to a business that many outsiders regard as duck soup, it involved some very serious matters requiring study and sober reflection.

The foregoing approach to dehydration might be termed the equipment approach. "We have the dryers, let's get into dehydration."

A comparable though differing approach would be the raw-material approach: "We have the raw-material resources, the government needs all the dehydrated foods it can get. We haven't the money, the factory nor any one who knows how to run a dehydrater, but we'll buy a book or subscribe to a magazine or something and Uncle Sam will put up the dough."

No outsider can speak for the government, but there are certain outstanding features of known government policy that have a bearing here. Uncle Sam needs the dehydrated foods in huge amounts—four times the 1942 capacity to produce, for vegetables alone. It is almost an unlimited demand, and authorized officials are exerting every effort to get the 400,000,000-lb. scheduled production.

But Uncle Sam is not going off the deep end just because someone possesses some equipment or has the raw-material supply available. As long as there are not enough critical metals available to build a lot of new plants, the policy seems to be that the existing equipment must be fairly close to sufficient raw materials or there will be no encouragement from official sources to get into dehydrated food manufacture. The encouragement is, of course, the coveted AA-2X priority rating, or possibly a Letter Purchase Order from QMC procurement agencies, or a possible grant of financial assistance (which is very rare).

It all comes back to the question of the proper factory location to decide who gets the official encouragement and help and priorities. Of course, if one is smart and resourceful, he can create a dehydration plant without official aids, but such cases are also rare; in fact, only one case is on record. If the need for dehydrated foods were not so urgent, it is likely that the wealthier corporations would employ a consulting agronomist, like A. L. Whiting, to spend a half-year sizing up the problem and selecting several choice locations. But this is war. The survey method, suitable for peacetime, is out. A shortcut must be found to reasonably successful choices.

Long Operating Season Required

Root crops and cabbage and onions right now are the vegetables most sought in dehydrated form. The other vegetables can come later. The average cannery will run, at most, about 8 to 12 weeks in a year when customary vegetables for canning are ripe for harvest, but today the government is hot after vegetables that are seldom canned in quantity. Such experience as the dehydration industry has gained to date indicates that most plants operate, not 8 to 12 weeks, but from 6 to 10 months every year, and 24 hours a day. Where to get the raw materials within a reasonable distance from a dehydration plant now takes on still greater significance. No single crop is available for any such length of time in any single locality. And while it may be possible in theory to count on a succession of different crops of early, middle and late varieties to mature in rotation to keep a plant going, all too often it is found to be true that a given locality is not capable of producing all manner of crops. Hence, the choice of a factory location to permit long operating seasons is a puzzle of a very intricate nature.

Everybody has in mind the idea of dehydrating potatoes to piece out the shorter crops. And potatoes will do the trick if the right varieties and quality can be produced locally or shipped in from moderate distances. But most large-scale commercial potato farming is located in northern states where other crops are not so easily procured. Potatoes have a fairly good storage life. Some authorities say potatoes can be held in proper storage up to 3 to 6 months and still be dehydrated into an acceptable product. As long as the vitamin C curve of stored raw potatoes is flat, or nearly flat, the potatoes are O.K. for dehydration, but when it suddenly shows rapid loss it is too late to produce a satisfactory dehydrated product. The product will not pass government buying inspection.

Some dehydrators have used cold storage for crops that, like onions, are

(*Turn to page 125*)

The onion dehydration plant of C. B. Gentry Co., Gilroy, Calif. This plant is located near the source of supply.

Compression of Dehydrated Foods Will Save Shipping Space

Bulk reduction promises to be next step in easing task of feeding our armed forces abroad and getting necessary food to Allies. Method also prolongs quality retention in dehydrated foods

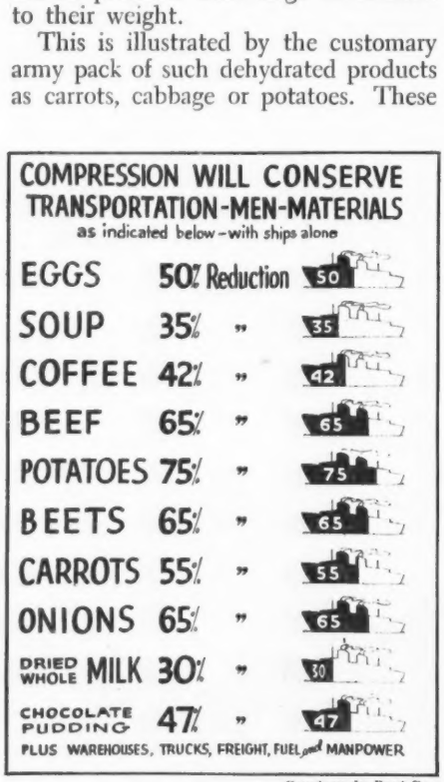
Courtesy du Pont Co.

One dozen-eggs, after dehydration, weigh only 5½ oz. and fill the tall container shown on the table. When these dehydrated eggs are compressed, they reduce to the six small blocks shown in the woman's hand.

WHILE dehydration of food removes, on the average, from 70 to 90 percent of the weight, by eliminating most of the water that goes to make up the raw food, it does not decrease the bulk of the food by nearly so much. This is particularly true, of course, of such products as dehydrated vegetables in sliced or diced form, in contrast to the powdered dehydrated foods, such as dry milk or eggs. Even in the latter case, however, the dehydrated products bulk large in relation to their weight.

This is illustrated by the customary army pack of such dehydrated products as carrots, cabbage or potatoes. These are filled into 5-gal. rectangular tins, which would hold up to 40 lb. of raw food. However, with the dehydrated food, these containers hold only from 11 to 17 lb.

With shipping space as scarce as it is, attention was naturally turned to compression, or compacting of foods by squeezing the particles more closely together and thus eliminating the air spaces between particles. In this way, a greater weight of food could be crammed into a given amount of shipping space.


COMPRESSION WILL CONSERVE TRANSPORTATION-MEN-MATERIALS
as indicated below—with ships alone
EGGS 50% Reduction 50
SOUP 35% " 35
COFFEE 42% " 42
BEEF 65% " 65
POTATOES 75% " 75
BEETS 65% " 65
CARROTS 55% " 55
ONIONS 65% " 65
DRIED WHOLE MILK 30% " 30
CHOCOLATE PUDDING 47% " 47
PLUS WAREHOUSES, TRUCKS, FREIGHT, FUEL and MANPOWER

Courtesy du Pont Co.

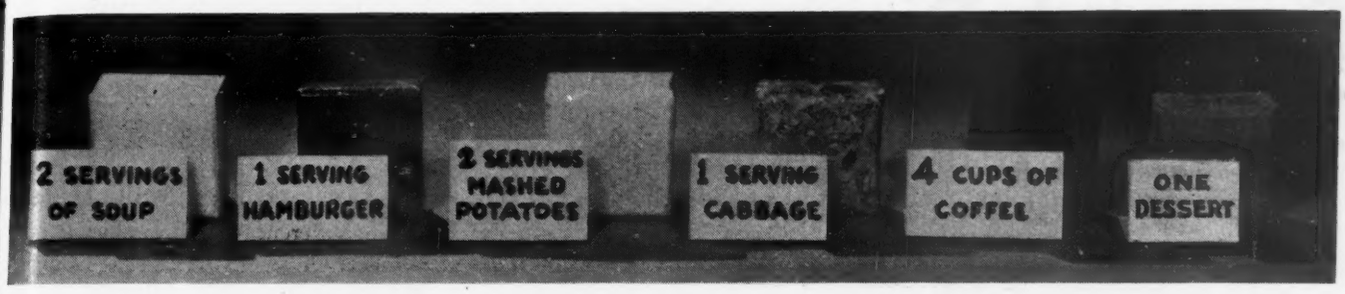
Savings in shipping space that can be made by the compression of dehydrated foods are indicated by this chart, in which the white portions of the ships indicate the space still needed after compression, while the dark portions are the space that can be saved.

Compression was first tried experimentally with such foods as flour. Later, it was applied to ground coffee. More recently, since dehydrated foods attained great importance in the feeding of our armed forces abroad and in shipments of Lease-Lend foods, compression has been applied to a wide range of dehydrated products. Space savings effected in this way range from 30 percent for dried whole milk to 80 percent for some powdered soups.

The present development, shown in some of the accompanying illustrations, is largely the joint work of Auto Ordnance Co., Greenwich, Conn., which developed a compression method and Cellophane Division, E. I. du Pont de Nemours and Co., Wilmington, Del., which developed a packaging method. According to this process, the dehydrated material is quick frozen before compression and is held at freezing temperatures during compression. This freezing process is said to prevent the fat globules in the food from breaking down during pressing. Temperature, time and pressure are varied to suit the products being compressed with pressures ranging from 250 to 2,500 lb. per square inch.

The small blocks of food from the press are delivered immediately to the wrapping machine. Moisture-vapor proof cellophane is used as a wrap, as this material gives good protection to the compressed foods. Standard cellophane wrapping machines, such as those used for cigarettes, can be readily equipped to do this work. After wrapping, the cellophane is heat-sealed to make a tight package. The output is stated to be 120 compressed and wrapped briquettes per minute.

Among the products that have been compressed in this way are meat, eggs, milk, potatoes, beets, carrots, onions,

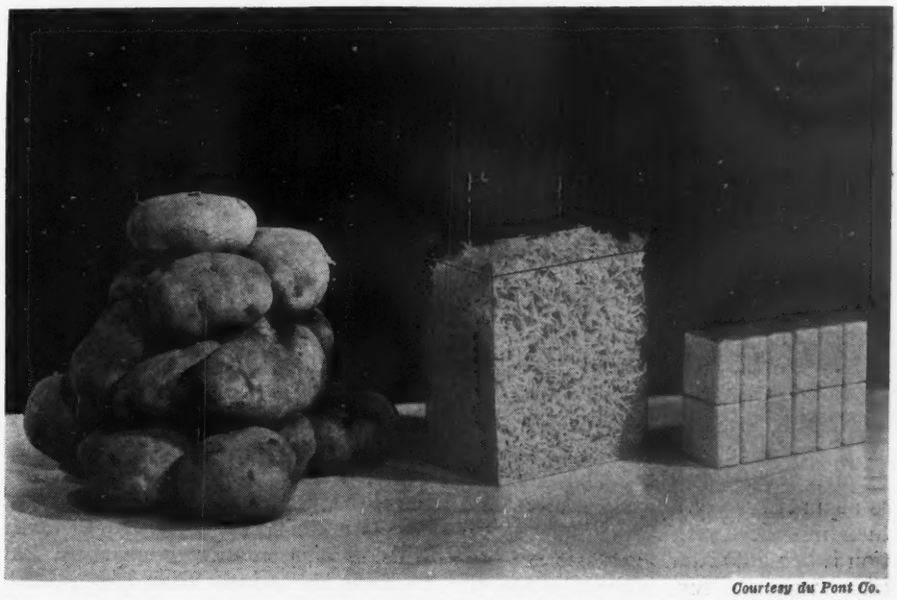


Cubes of compressed foods of different kinds, wrapped in cellophane.

cabbage, soups, puddings and precooked cereals.

Besides the advantage of space saving, experience to date is reported to indicate that compression and the resulting reduction of the food surface exposed to the air improves the keeping qualities. Compression also squeezes out most of the air, thus further decreasing the opportunity for oxidation. In addition, the cellophane wrapper protects the contents from moisture, microorganisms, grease or dust. As a test, samples of dehydrated eggs were compressed and wrapped in cellophane four years ago. These are reported to be still in good condition.

Compressed foods have not yet reached the stage of commercial exploitation, except in the case of compressed soups. However, should the government approve the method for military and Lease-Lend purposes, there is little doubt that compressed foods will also soon find a place on the civilian market.



Courtesy du Pont Co.

Nine pounds of raw potatoes, reduced to dehydrated potato shreds, weigh 18 oz. and fill container shown at center. Compression reduces the bulk by an additional 75 percent, to the block of 12 cakes shown at right.

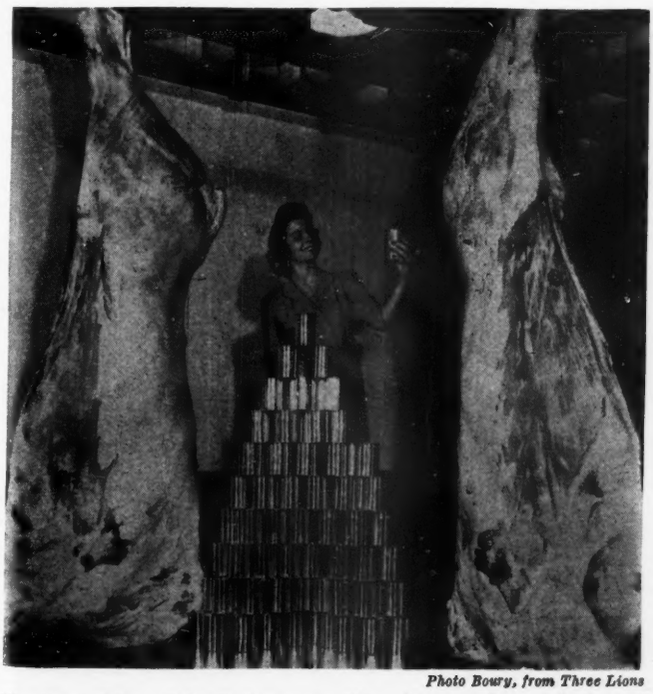
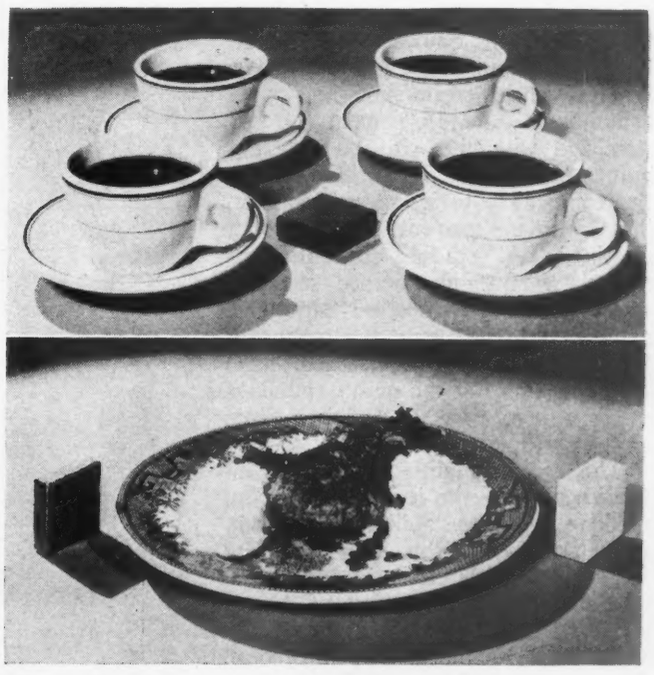


Photo Bourg, from Three Lions

The two sides of beef shown in this picture, when dehydrated and compressed, are equal in space requirements to the pile of 132 twelve ounce cans shown in the center—a big saving in shipping space.



ABOVE: One cube of compressed coffee makes four cups of the beverage. BELOW: A plate of "Salisbury steak" and mashed potatoes which is the equivalent of the cubes of compressed dehydrated meat and potatoes shown alongside.

Research Discovers New Stabilizer

By GIDEON HADARY
Industrial Fellow, College of Agriculture, University of Wisconsin, Madison, Wis.

Extract of quince seed found effective as stabilizer for dairy products. Discovery is significant because of drying up of sources of supply for gums and alginates suitable for use in making nonsettling suspensions

WITH the outbreak of war has come a shortage in available supplies of colloidal food stabilizers such as alginates, various gums, gelatine and their modifications. As a result, attention is being directed towards other possible sources of food stabilizers and to the findings of research workers in the field of science which might be of commercial interest under present-day conditions.

In the latter category is the study of the properties of quince seed water extract as a stabilizer for dairy products. Studies with ice cream show that mixes containing 10 to 16 percent fat and stabilized with 0.03 to 0.04 percent quince seed extract have body properties comparable to ice creams containing 0.3 to 0.4 percent of 225 bloom gelatine.[1] At those concentrations neither gelatine nor quince seed extract showed any decided advantage as far as flavor or body and texture of the ice cream were concerned. The whipping times of the quince-stabilized mixes were slightly shorter than those of the gelatine-stabilized mixes.

The effect of quince seed extract on the viscosity of the ice cream was immediate. Quince-stabilized ice cream mixes attained their maximum viscosity immediately after processing. Addition of 0.010 to 0.025 percent of quince seed extract in dry form decreased the viscosity of the mixes as compared to the viscosity of the nonstabilized mixes. When the dried extract was added in quantities of 0.030 percent or greater, the mix viscosity increased as compared to that of nonstabilized mixes. However, ice cream stabilized with quince seed extract did not melt as uniformly as did that stabilized with gelatine. The extract dissolves readily in the ice cream mix at from 45 to 190 deg. F. and lends itself to homogeneous incorporation in the mix.

Use in Chocolate-flavored Milk

Subsequent studies involving the use of quince seed extract in chocolate or cocoa milks showed that sirups containing 0.3 to 0.4 percent of the extract mixed into 10 parts by volume gave a nonsettling chocolate-flavored milk.

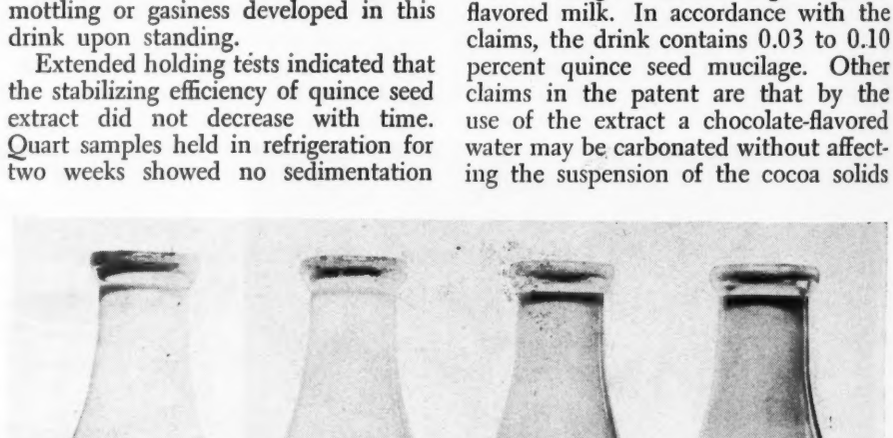
Milk containing 0.03 to 0.04 percent quince seed extract had a uniform distribution of cocoa solids throughout, with no sedimentation or creaming. No mottling or gasiness developed in this drink upon standing.

Extended holding tests indicated that the stabilizing efficiency of quince seed extract did not decrease with time. Quart samples held in refrigeration for two weeks showed no sedimentation and had retained a uniformity of appearance.

Addition of sirup stabilized with quince seed extract did not materially increase the viscosity of the milk mix (Table I), nor did the viscosity of the quince-extract-stabilized chocolate or cocoa milks change as time after processing increased.

No difference in the efficiency of stabilization of the hot and cold drinks was detected. In fact, extensive studies indicated that the sirup may be added to the milk at temperatures ranging from 40 to 240 deg. F. without any deleterious effects upon the stabilization of the final product. Even when sirup containing 0.30 to 0.40 percent quince seed extract was diluted in the ratio of 1 part to 10 of hot or cold water, no cocoa particles settled out, indicating that suspension of the cocoa solids by the extract is not dependent upon the presence of milk constituents.

Since completion of this work with quince seed water extract, a patent relating to the use of quince seed extract as a stabilizer for chocolate flavored milk has been granted.[2] According to the patent claims, addition of sirup consisting of 10 percent cocoa powder, 55 percent sugar, 34 to 35 percent water and 0.30 to 1.0 percent quince seed extract to hot or cold milk in the ratio of 1 to 10 will give a nonsettling chocolate-flavored milk. In accordance with the claims, the drink contains 0.03 to 0.10 percent quince seed mucilage. Other claims in the patent are that by the use of the extract a chocolate-flavored water may be carbonated without affecting the suspension of the cocoa solids



Effect of quince seed extract in stabilizing chocolate milk prepared by hot process. Left to right, not stabilized; stabilized with 0.01 percent quince seed extract; 0.03 percent; 0.04 percent.

in the water, or otherwise impairing its good qualities, and that a nonsettling, sterile chocolate-flavored drink can be made using the extract as a stabilizer.

Preparing Quince Seed Extract

The quince seed extract used in these studies was obtained by soaking 1 part of dry quince seed (Grade A, Persian) in 10 parts by weight of water, heating to boiling with constant agitation, and holding at that temperature for ½ hour. During this period the mass thickened to form a brownish mucilage. To separate the seeds from the mucilage, the mass was filtered through cheesecloth. After the mucilage was separated, the seeds were again placed in water, and the extraction process was repeated. The mucilage was further treated by spreading in thin layers on trays over a warm sand bath, and drying to form thin light brown sheets which were then pulverized. Amount of yield by these extractions is a direct function of time and temperature of extraction. A yield of 23.5 percent of the original weight of the seeds is obtained by the method used.

TABLE I—Effect of Quince Seed Extract on the Viscosity of Chocolate-flavored Milk.

Sample	Viscosity (percent of nonstabilized-drink viscosity)
Unstabilized drink, cold process	100
Stabilized drink (0.03% quince), cold process	103
Stabilized drink (0.03% quince), hot process	107

To hasten the drying process, the active material in the mucilage may be precipitated with alcohol or with salts of phosphoric acid. The precipitate forms a stringy grayish film-like material which dries to give a brittle substance that easily can be pulverized.

Source and Characteristics of Quince Seed

The source of the quince seeds is a small tree of the order Rosaceae, Suborder Pomeae, and allied to Pyrus. Its leaf, flower and fruit closely resemble those of the apple and pear trees. Quince is a native of the Near East and is grown extensively in Asia Minor and Persia. It is widely cultivated over much of the apple growing areas of the United States, but since the trees are not grown in large acreage, there are no published data on the number and distribution of trees or on the production of the fruit.

The fruit of quince is unfit to eat unless cooked. Its use is confined to making preserves and marmalades. It may be used alone or as a means to enhance the flavor in mixtures of fruits. The seeds are generally discarded as waste material.

Because the quince seed coat is a highly complex combination of cellulose or hemicellulose with a polysaccharide that yields arabinose and xylose on hydrolysis, it is devoid of any toxic properties. The neutral gum of quince seed has been reported to contain about 6 percent ash, 25 percent SiO_2, and 15 percent R_2O_3, 16 percent CaO, and 8 percent MgO, with considerable amount of phosphate.[3]

Although the quince is related to the apple, quince seeds, in contrast to those of the apple, are not pectinous; in fact, adulterations of quince seeds with the cheaper apple seeds is detected by testing for pectin.

References

1. G. Hadary and H. H. Sommer, Quince Seed Extract as an Ice Cream Stabilizer, 1941. Unpublished material.
2. E. A. Siehrs, Chocolate-flavored Drink and Process of Producing Same, U. S. Patent No. 2,267,624. Issued, December, 1941.
3. *Journal of Biological Chemistry*, vol. 97, 503-510, 1932.

WPB Issues Specifications On Closures for Glass

Makes closures available for glass containers in which to pack foods that can't be packed in tin

Regulations on the use of metal and rubber in closures for glass food containers were issued by the WPB on January 1 in the form of an amended version of Conservation Order M-104. This latest amendment makes available the closures for glass containers in which to pack a large number of food products which may not be put into tin cans, and the purpose of the change is to offset the restrictions on the packing of foods in tin. Included in this group are:

Fish products—Clam broth, fish pastes and lobsters.

Dairy products—Cheese spreads, ice cream mix and malted milk.

Sirups and honey—Sirups, blended; and chocolate or cocoa sirup.

Vegetables and vegetable products—Beets, carrots, tomato catsup, juices.

Fruits—Apples, apple sauce, apricots, figs and fruit juices.

Meat products—Beef, dried; chicken and turkey, boned; chili con carne; chopped luncheon meat; pig's feet; and sausage in casing.

Olives, pickles, relishes, condiments and sauces—Pickles, mustard and horseradish.

Edible oils and dressings—Dressings, sandwich spread and tartar sauce.

Miscellaneous foods—Baking powder, flavoring extracts, peanut butter and other nut butter, dehydrated soups and spices.

Provision is also made for packing pork and beans in glass whenever a substitute for rubber gaskets is perfected; experiments are now under way on such a substitute.

The amount of closures that can be used for food products during 1943, together with the 1943 packing quotas, will be found in Schedule I (Food Closures) of Order M-104, which follows:

Product	1943 packing quota	Closure material indicated by X: Tin-plate	Black-plate	Rubber
MEATS AND MEAT PRODUCTS				
1. Beef, dried	75% 1941	X	..	..
2. Chicken, boned, and turkey, boned	50% 1942*	X	..	X
3. Chili Con Carne, when packed without beans and containing not less than 50 percent meat, by uncooked weight, exclusive of added tallow	25% 1942*	X	..	X
4. Corned beef hash	100% 1941*	X	..	..
5. Lamb's tongue, pickled	100% 1942	X	..	..
6. Meat loaf, containing not less than 90 percent meat, by uncooked weight and no added water. When packed as a chopped product, meat loaf may contain not more than 10 percent of the following ingredients: cereal, whole milk, eggs and seasoning	25% 1942*	X	..	X
7. Meat spreads, including ham, tongue, liver, beef, and sandwich spreads. When packed as a spread, the chopped product shall contain not less than 65 percent meat, by cooked weight, with added cereal or other products. When packed as deviled ham or deviled tongue, the product shall consist of chopped meat without added cereal or other products	25% 1942*	X	..	X
8. Chopped luncheon meats, consisting of chopped, seasoned meat with not to exceed 3 percent added water, by weight	25% 1942*	X	..	X
9. Mince meat, fresh apples only	100% 1942	..	X	..
10. Pig's feet and cutlets, pickled, semi-boneless	100% 1942	X	..	..
11. Sausage in casings, Vienna style, containing no cereal or similar substance and not to exceed 10 percent added water, by weight	100% 1942	X	..	X
12. Tongue	100% 1942*	X	..	X

(Turn to page 96)

Bulk Storage and Blending Aid Price, Quality Control

By EDGAR S. MILLER, Consultant, Minneapolis, Minn.

PART I—In flour milling it is difficult to control the characteristics of the product accurately on the production line. Millers find it easier to meet specifications if they put flour into bins, analyze it and blend to attain desired qualities

GOVERNMENTAL control of prices or of source of production in any field of industrial activity must contemplate some measure of standardization of products. This standardization is particularly significant in the making of wheat flour. Brands and trade names mean nothing. Even "quality," a vague and indefinite term that has long since been thrown into the discard by technologists concerned with either the manufacture or the use of flour, becomes even more meaningless.

To state, truthfully and accurately, that a certain flour is "high patent," "family patent," "long patent," or what have you, milled from "hard red winter wheat," or any other kind of wheat, is not enough. Also, to say that a flour actually represents some definite "percentage of extraction" is not enough.

It is extremely difficult for an individual milling unit to maintain uniformity of products hour by hour, and it is obvious that some practical means of "leveling off" inequalities must be used if the needs of the purchaser are to be satisfied. Difficulties are greatly multiplied when the products of one mill must be made to match those of another mill which is operating, or has been operating, in a different section of the country, in a different climatic environment. Bulk flour storage and blending of all flours of a class produced seem to be the answer.

"Storage" implies passage of time during which the product lies dormant. Since nothing is more evident at the present moment than the necessity for speedy and uninterrupted production and distribution, to advocate any procedure which apparently interrupts the flow of processed products, for any purpose other than accumulation to facilitate handling and transportation, may seem at variance with common sense. There is, however, an old adage to the effect that to "make haste slowly" is often wise.

Time has been aply called "the fourth dimension," and it could with equal accuracy be termed an indispensable ingredient. For time is required to produce the components of most of the things essential to living, including food. And it is well to remember, particularly in times like these, that one faulty ingredient may, when used with others, result not only in its own loss but in the complete loss of the whole combination.

Storage of flour for some period of time between its actual manufacture and its packaging and removal from the mill has been practiced at least since the beginning of "the millstone era." However, control of quality was not a conscious purpose then, nor has it ever been, until comparatively recent times.

Meaning of Flour Quality

To the technologist and operator alike, the term "flour quality" can only imply the possession of certain properties which make the product capable of satisfactory performance. Since required performance varies in accordance with the nature of the baked product as well as with the method the user prefers to follow, that which is high quality in one case may

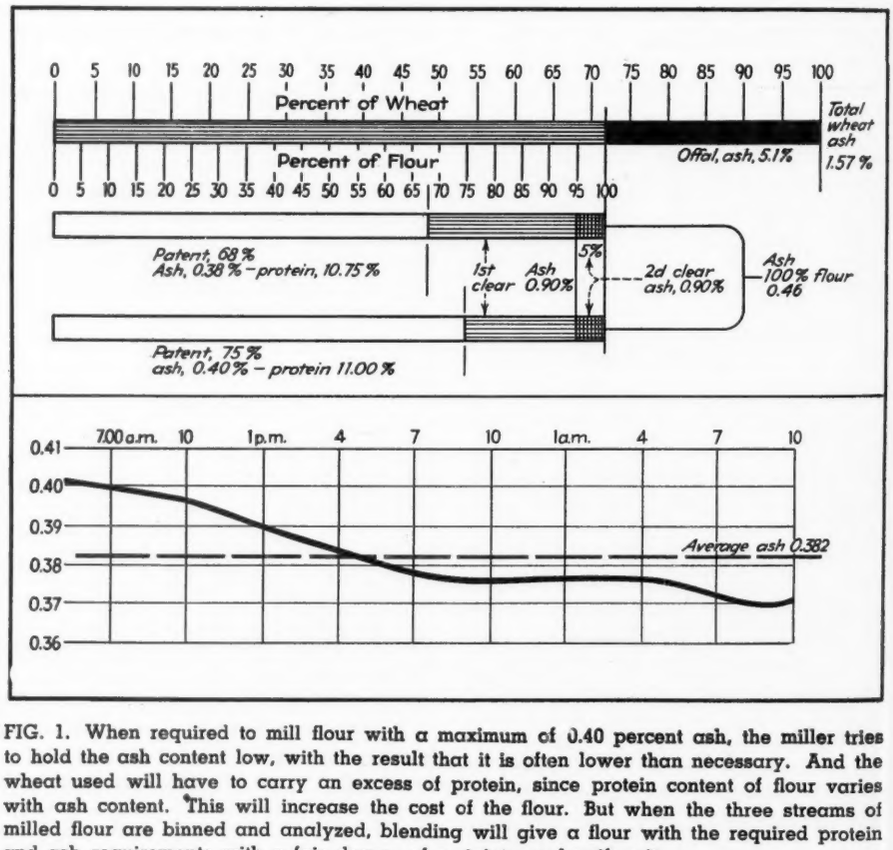


FIG. 1. When required to mill flour with a maximum of 0.40 percent ash, the miller tries to hold the ash content low, with the result that it is often lower than necessary. And the wheat used will have to carry an excess of protein, since protein content of flour varies with ash content. This will increase the cost of the flour. But when the three streams of milled flour are binned and analyzed, blending will give a flour with the required protein and ash requirements with a fair degree of certainty and uniformity.

be considered anything but high quality in another. Thus the degree of offal contamination, represented by the ash yielded upon burning the flour, is only one of many factors affecting flour quality. It is, however the most significant factor of the price-quality structure in connection with flours produced from any one of different types of milling wheat.

The nature of flour is, of course, largely dependent upon the nature of the wheat from which it is made. Theoretically, this is controllable by wheat selection. But, in practice, modifications are effected in many ways—(1) through grain conditioning, (2) mill adjustment and (3) laboratory control. If, for example, a certain wheat blend yields flour deficient in gassing power, diastatic activity may be satisfactorily altered by the introduction of a small quantity of flour milled from malted wheat. The procedure is simple and productive of highly accurate results.

The enzymic properties of the flours produced from any wheat may be significantly altered by the conditioning of the grain and the action of the reducing machines. Even the ratio of gluten to carbohydrates in a high-grade flour may be adversely affected by the milling procedure itself. While there are comparatively simple means for rectifying enzymic deficiencies, there is no method through which an unfavorable ratio of offal proteins to gluten proteins can be corrected. That mill performance be constantly and accurately checked and controlled is, therefore, imperative. In no other way can there be any assurance that the "quality" the buyer has a right to expect can be delivered.

Bulk storage sufficient to permit laboratory analysis—preferably including baking tests—before any flour manufactured is packed and shipped gives the manufacturer the opportunity to procure full information concerning the properties of the product intended for shipment. If these do not meet the specifications of the purchaser, shipment is held up. Rectifications may be accomplished by blending the product with other flours capable of carrying it, or it may be held and later sold to some purchaser whose specifications it will meet or who is willing to make some sort of adaptation. In any case a profitable transaction is not indicated, yet the procedure is preferable to shipment prior to analysis.

The greater part of the flour milled today, at least in North America, is required to conform to specifications laid down by the purchaser. The modern commercial bakery follows certain production methods designed to promote profitable operation, with high labor costs and limited selling prices taken into consideration. These methods usually cannot be modified in any considerable degree without some sacrifice of economy. For this reason a great deal of pains is taken by the purchaser or his agents to determine what properties of flour most nearly fit shop methods in producing various types of baked goods, and to procure flours with those properties. Flours intended for home baking may not be as rigidly scrutinized as are those going into the large commercial bakeshop, but since it is no less important that they meet with continuing approval, the manufacturer cannot afford to mill them less carefully or less conscientiously.

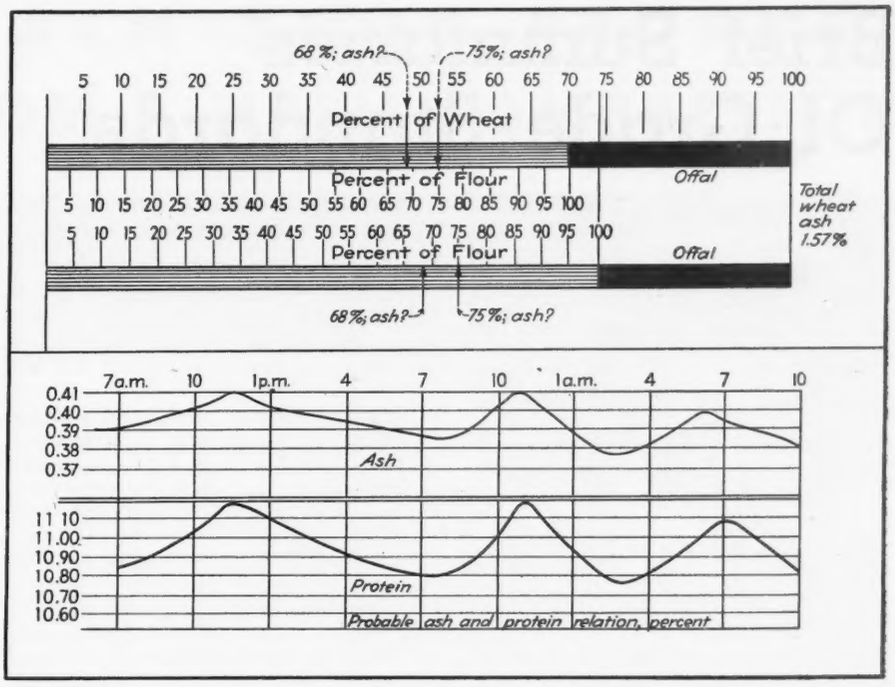


FIG. 2. The aggregate ash and protein of the flour plus that of the offal equal the total ash and protein of the wheat. But variations in yield result in fluctations of flour ash content, with corresponding changes in protein. But since the ash contents of the three millstreams and of the offal vary, the ratio of flour to offal does not give a corresponding ratio of ash and protein in the various streams. So to attain uniformity the flour streams should be binned and blended, after analysis.

Protein and Ash Important

The most common specifications are concerned with flour proteins and ash, probably with curves indicative of "handling properties" included for bread flours and viscosity and pH value for flours to be used in making cakes, cookies, crackers and biscuits. Protein and ash contents are expressed as percentages based upon the weight of flour with stipulated moisture content. The critical criterion is essentially the ratio of the one to the other. If the specifications should call for a minimum of 11.00 percent protein and a maximum of 0.40 percent ash, either 10.9 percent or 0.41 percent, respectively, makes the product unacceptable to the purchaser.

Most modern mills regularly produce three different flours from the same wheat at the same time. These are ordinarily designated technically as "patent," "1st clear" and "2nd clear." This "patent," however, does not necessarily correspond to any commercial grade called "patent." In the mill it is simply a stream made up of various streams of flour resulting from the reduction of the purer of the mill stocks, such as purified middlings. Its ash and protein content are relatively low; the figures for "2nd clear" are high, with the "1st clear" coming in between in ash and protein content.

Counting all the flour produced as 100 percent, mill stream "patent" from wheat suitable for bread making will often run no higher than about 68 percent. Commercial "patents" include this millstream patent, of course. But, since they may amount to from 75 to 95 percent, or even more, of the total flour, inclusion of lower grade streams in such flours is obvious. Thus, the word "patent" is meaningless in a commercial sense. For that reason millers are required either by edict or by self interest, to "mill to specifications."

Brief Summaries Of Grade Standards

For the convenience of those who control quality in the food industries, the following digests have been prepared of standards issued by the Agricultural Marketing Administration.

ABSTRACTS containing the principal requirements of the standards issued by the Agricultural Marketing Administration of the Department of Agriculture are prepared by FOOD INDUSTRIES. The standard which follows and those published in August, September, October and November, 1941; July, August, September, October, November and December, 1942; and January, 1943, are a continuation of the series begun in 1940.

The complete text of the standards can be obtained from the Agricultural Marketing Administration, located in Washington, D. C.

Frozen Snap Beans
(Tentative)

FROZEN SNAP BEANS are prepared from the fresh immature pods of the stringless varieties of garden beans, by snipping the pod ends, washing and scalding, and are frozen and stored at temperatures necessary for the preservation of the product.

Round type snap beans are pods the width of which is not more than one and one-fourth times the thickness. Flat type snap beans are pods the width of which is more than one and one-fourth times the thickness. Green beans are snap beans of any of the green varieties. Wax beans are snap beans of any of the yellow or golden varieties. Whole snap beans are substantially whole pods with the ends of the pods snipped. Cut snap beans are pods cut transversely into segments. Shoestring (French Cut or Julienne) snap beans are pods or pod sections cut lengthwise into strips.

U. S. GRADE A or U. S. FANCY frozen snap beans are pods or pod sections of beans of similar varietal characteristics which possess a practically uniform typical color; are practically free from defects; are tender and practically free from internal tissue rupture; possess a normal flavor and odor; and score not less than 85 points.

U. S. GRADE B or U. S. EXTRA STANDARD frozen snap beans are pods or pod sections of beans of similar varietal characteristics which possess a reasonably uniform typical color; are reasonably free from defects; are reasonably tender and reasonably free from internal tissue rupture; possess a normal flavor and odor; and score not less than 70 points.

OFF-GRADE frozen snap beans are snap beans that fail to meet the requirements of U. S. GRADE B or U. S. EXTRA STANDARD.

The various sizes of frozen snap beans are as follows: No. 1—12/64 to 14½/64 in. in diameter. No 2—14½/64 to 18½/64 in. No. 3—18½/64 to 21/64 in. No. 4—21/64 to 24/64 in. No. 5—24/64 in. or larger.

Frozen snap beans are graded after having been carefully thawed under a gentle spray of tap water at room temperature. The flavor and odor of frozen snap beans is determined after cooking in boiling water in an uncovered container. The cooking time is 15 minutes for green snap beans and 20 minutes for wax snap beans. The grade of frozen snap beans may be ascertained by considering in addition to the foregoing requirements, the following factors: Color, absence of defects, character and maturity. The relative importance of each factor has been expressed numerically on a scale of 100.

Color—To receive a score of 17 to 20 points the frozen snap beans must have a practically uniform typical color. Green beans may have not less green nor more grey than Plate 2, L-8;[1] wax beans may have not less yellow nor more grey than Plate 10, I-2.[1]

If the snap beans possess a reasonably uniform typical color, a score of 14 to 16 points may be given. The pods may vary in color with the predominant color for green beans being not less green nor more grey than Plate 23, L-3,[1] and that for wax beans, not less yellow nor more grey than Plate 11, K-2.[1]

If the frozen snap beans are decidedly variable in color or definitely off color for any reason, or if they fail to meet these requirements, a score of 0 to 13 points may be given. Frozen snap beans that fall into this classification shall not be graded above OFF-GRADE, regardless of the total score.

Absence of Defects—A unit is considered "damaged" if a blemish or blemishes cover an aggregate area exceeding the area of a circle ¼ in. in diameter. Units with black or very darp spots, worm holes or serious insect injury are considered damaged. "Small pieces" are cut or broken pod sections less than ¾ in. in length. "Split" units are pod sections split into two parts. "Irregularly cut" units are pod sections that have ragged edges, are partially cut, or are cut at less than a 45-deg. angle.

To receive a score of 34 to 40 points the beans must be practically free from defects. There may be present no harmless extraneous vegetable material; no units possessing tough, inedible strings. Whole or cut beans may not have more than 1 percent by count of unsnipped or loose stem ends, not more than 2 percent of spotted, blemished or otherwise damaged units; and not more than 2 percent of small pieces, split units or irregularly cut units. For each 10 oz. of net weight of shoestring beans there may be present not more than two unsnipped or loose stem ends, not more than 4 spotted, blemished, or otherwise damaged units; and not more than 4 small pieces.

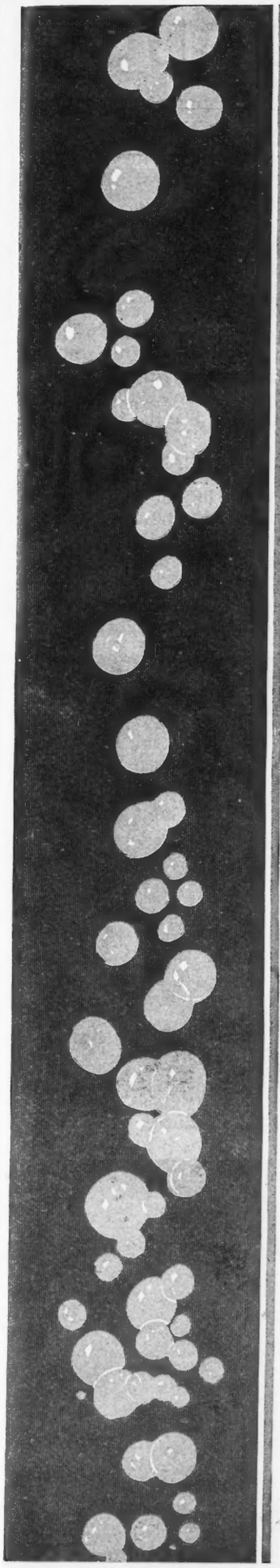
If the beans are reasonably free from defects, a score of 28 to 33 points may be given. Beans that fall into this classification shall not be graded above U. S. GRADE B or U. S. EXTRA STANDARD. "Reasonably free from defects" means: There may be present not more than one small piece of harmless extraneous vegetable material for each 10 oz. of net weight. Whole or cut beans may have not more than 2 percent by count of units possessing tough, inedible strings; not more than 2 percent by count of unsnipped or loose stem ends; not more than 5 percent by count of spotted, blemished or otherwise damaged units; and not more than 4 percent by count of small pieces, split units or irregularly cut units. Shoestring beans may have not more than 4 units possessing tough, inedible strings; not more than 5 unsnipped or loose stem ends; not more than 10 spotted, blemished or otherwise damaged units; and not more than 8 small pieces. Frozen snap beans that fail to meet these requirements may be given a score of 0 to 27 point sand shall not be graded above OFF-GRADE.

Character and Maturity—The factor of character and maturity refers to the texture and degree of internal tissue rupture (white patches of skin or "feathering") as well as to the development of the pods and seeds. To receive a rating of 34 to 40 points the snap beans must be tender and fleshy, free from fibrous tissue, and not more than 5 percent of the units by count may have visual evidence of internal tissue rupture. A score of 28 to 33 points may be given if not more than 5 percent by count of units possess fibrous tissue, and not more than 10 percent have visual evidence of internal tissue rupture. Frozen snap beans that fall into this classification shall not be graded above U. S. GRADE B or U. S. EXTRA STANDARD. Frozen snap beans that fail to meet the requirements of the above paragraph may be given a given a score of 0 to 27 points and shall not graded above OFF-GRADE.

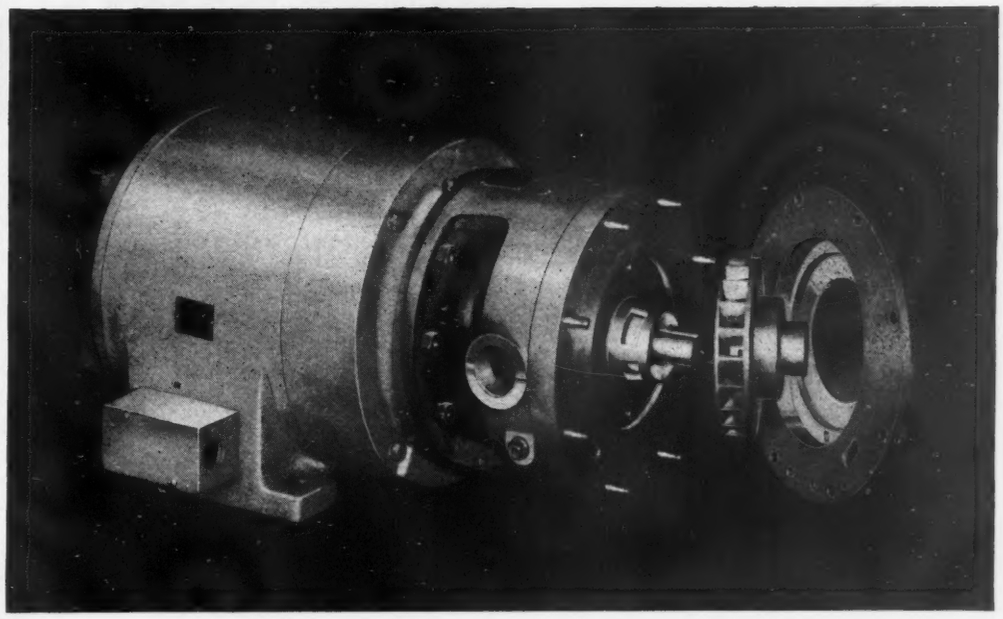
The grade will be determined by averaging the score of all containers, provided not more than one-sixth of the containers fail in some respect to meet the requirements of the grade indicated by the average score. However, none of the containers may fall more than 4 points below the minimum score for the grade indicated by the average score.

ISSUED: September 17, 1942
EFFECTIVE: October 1, 1942

[1] Maerz and Paul's "Dictionary of Color."



ONLY CLEAN AIR CAN REACH YOUR PRODUCT FROM A NASH COMPRESSOR



Here is a compressor designed perfectly to meet the needs of the Food Plants. It is simple, for it has only one moving part, a rotor cast in one piece and rotating in the casing without metallic contact. This means trouble-free operation over long periods. It is compact and requires little valuable floor space. Its oversize ball bearings seldom require attention or lubrication. No lubrication is required in the interior, so that the air is kept clean from the time it enters the pump. • But this is not all. The compressing medium in the Nash Pump is a rotating column of clean water. The air is in intimate contact with this water in passing thru the pump and is actually scrubbed while it is being compressed. Dust present in the atmosphere is removed, and the air delivered free from dirt, oil, or heat, without the use of scrubbers or air washers. Think what this means in terms of purchase cost and floor space occupied by complicated air washing apparatus. • These pumps are proving their worth in the most trying service. They are ideal for transferring beer or wort from tank to tank by air pressure, for maintaining pressure on aging tanks, for supplying compressed air to bottling machines in racking, etc. • Available in any capacity, these pumps deliver pressures up to 40 lbs. absolutely uniform without storage tanks. • You want the most reliable pumping equipment in your plant, so by all means find out more about the Hytor. Our catalog No. 217 is free on request.

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NEW PACKAGES & PRODUCTS

New Way To Close Bags

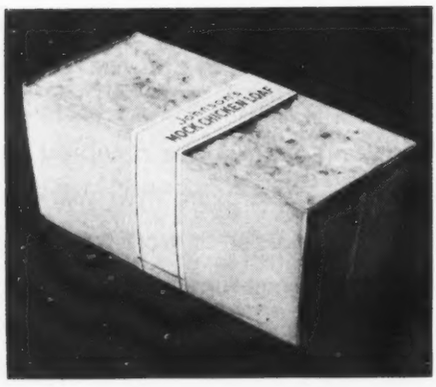
A CLOSURE gadget intended to replace wire staples has been developed by Milprint, Inc., as a method of closing bags without using metal. The heavy paperboard "Bag-Lok" fastens any bag formerly closed with staples or metal inserts, and the bag can be reclosed by the consumer after opening, to keep the contents fresh. The folding "Bag-Lok," which closes securely over the top of the bag, has space on back and front for a printed sales message.

Patriotic Labels

To remind housewives to save empty tin cans, many canners are placing on their labels a conspicuous design or slogan on the salvage program. Among others, Curtice Brothers Co., Rochester, N. Y., is featuring the words, "Help to Win, Save This Tin." on the label of of every can that leaves the plant. Another design entitled "Salvage for Victory" gives the housewife complete instructions on preparing the can for the scrap collection. Label Manufacturers National Association has endorsed the plan and sample labels may be obtained by writing to them at 1700 Eye St., N.W., Washington, D. C.

Paper Loaf Pans

MANY packers and provisioners today are faced with a shortage of metal pans used for packing souse, scrapple and a variety of loaf specialties. As an alternate container for this purpose, Sutherland Paper Co., Kalamazoo, Mich., has developed a leakproof loaf pan constructed entirely of paperboard.



The loaf pan, available in 3-lb. and 6-lb. sizes, is made of heavy weight stock and specially treated with a solution which enables it to withstand higher temperatures than permitted by ordinary paraffin or wax. Armour & Co., Kingan & Co. and Cudahy Packing Co. are among those already using the pans, which have printed identification bands.

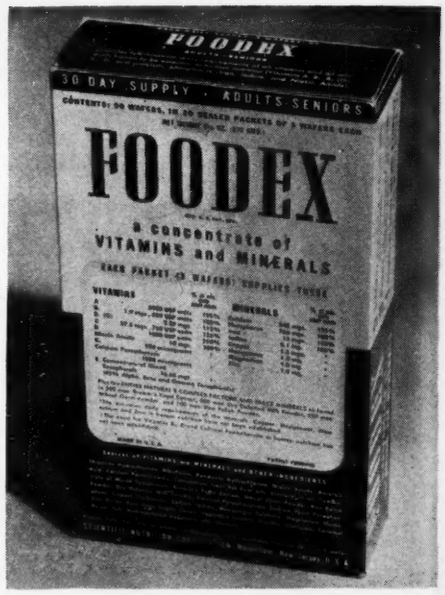
Food, Coffee Stretchers

TYPICAL of products brought out overnight to fill a demand during this wartime rationing era are "Jewel's Coffee Stretcher," "Bulkee Food Stretcher," and "Mixit Coffee Filler." Both the type of products and packaging indicate a trend that will become more evident as the war progresses.

The coffee stretcher marketed by Jewel Food Stores (a department of Jewel Tea Co.) consists of Mexican garbanzos, roasted and packed by the company in a waxed glassine envelope inside a stapled paper bag. "Bulkee" food stretcher, a product of Bulkee Packing Co., Chicago, Ill., contains wheat, corn, rice, rye, salt, pepper, spices, vegetable proteins, dry whole milk, baking powder and powdered egg; it can be used to make croquettes, fritters, patties, loaves and hashes. The mix is packed in a paper bag inside a 7-oz. paperboard container. "Mixit" coffee filler, put out by Mixit Cereal Coffee Co., Chicago, is a cereal coffee stretcher containing roasted rye, barley and wheat, and is packaged like the Jewel product.

Vitamin-Mineral Food

OUTSTANDING in the field of vitamin tablets and concentrates is "Foodex," product of Scientific Nutrition Corp., Bloomfield, N. J. "Foodex" is said to meet or exceed all U. S. government minimum daily requirements for every essential vitamin and mineral. To test



QUALITY NEVER TAKES A HOLIDAY

. . . when machines are kept "tuned up" by men like this

GEORGE SHARPE has had fourteen years' experience in the maintenance and repair of glass machines. He's proud of those years, for they've brought him a sure, swift touch with tools. He's even prouder of the fact that his skill, and the skill of men like him, keep the machines in Armstrong's plants always in top condition.

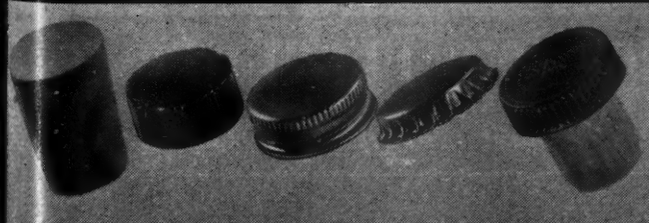
That pride of craftsmanship is typical of the men and women who make Armstrong's Glass. They feel that, in their own special fields, they're artists. And they know that the production of top-quality glass is still an art.

Because of George Sharpe and men like him, the machines in Armstrong's plants are steady workers, turning out glassware of the consistently high quality you expect of it, glassware that does a real packaging job and is saving tons of precious metals. Their experience and skill are your assurance that Armstrong's Glass will always be top-quality glass.

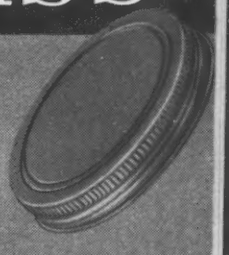
For the story of Armstrong's Glass and the men and women who make it, write for the new free booklet, "Men and Glass." Armstrong Cork Company, Glass and Closure Division, 4202 Jackson Street, Lancaster, Pennsylvania.

The employees of Armstrong's Closure and Floor Division Plants in Lancaster have been awarded the joint Army-Navy Production Award for high excellence in war production.

ARMSTRONG'S GLASS



and ARMSTRONG'S CLOSURES



EYE-APPEAL is a tested, sure-fire sales aid. By using lithographed Armstrong's Metal Caps, you can still get extra eye-appeal into your glass packages in spite of wartime standardization.

Whatever you can do to make your standardized packages stand out from the others in retailers' displays will help put your products into Mrs. Consumer's shopping bag.

Decorated caps will do this for you economically. They'll keep on selling for you, too, delivering your sales message every time your container is opened and re-opened.

Write today for complete information about lithographed Armstrong's Metal Caps and Armstrong's complete line of glass containers. Or send in your wartime package for a cap design suggestion. There's no obligation. Armstrong Cork Company, Glass and Closure Division, 4202 Jackson Street, Lancaster, Pennsylvania.

The employees of Armstrong's Lancaster Closure and Floor Division Plants have been awarded the Army-Navy "E" Award for excellence in war production.

ARMSTRONG'S CLOSURES

TURN STANDARD CONTAINERS INTO STAND-OUT PACKAGES

the role of "Foodex" in industrial production, a feeding survey was conducted in a defense plant, with 500 men receiving a supplemental ration of the product and 500 receiving no supplement. The "Foodex" group registered the following results: 33.9 percent increase in man-day production value; 37 percent decrease in spoilage of materials; and 17 percent of the increased earnings were credited to "Foodex."

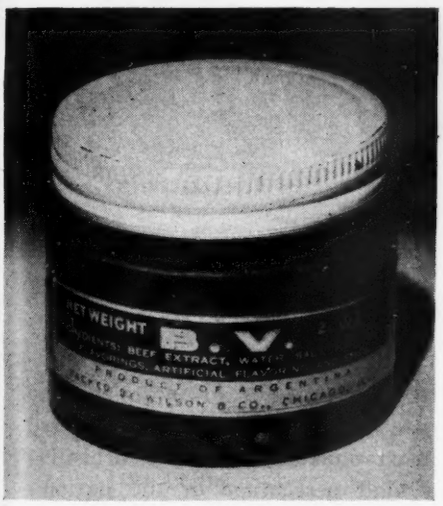
Contained in each tablet of "Foodex" are these ingredients:

Thiamin hydrochloride, riboflavin, pyridoxin hydrochloride, niacin amide, ascorbic acid, calcium pantothenate, concentrate from fish liver oils, viosterol in oil, concentrate of mixed tocopherols, brewer's yeast extract, wheat germ powder, rice polish powder, dry defatted milk powder, calcium pyrophosphate, sodium ferric pyrophosphate, copper carbonate, sodium iodide, manganese sulphate, magnesium oxide, zinc oxide, cane sugar, cocoa, vegetable lecithin, vanillin, chocolate, caramel flavor, salt, hydrogenated vegetable oils and glycerin.

The 9½-oz. carton contains a 30-day supply, or 90 wafers in cellophane packets of three wafers each.

From the Pampas

"B. V." BEEF extract, packed by Wilson & Co., Chicago, is a product of Argentina, containing beef extract, water, salt, soup stock, flavorings and spice.

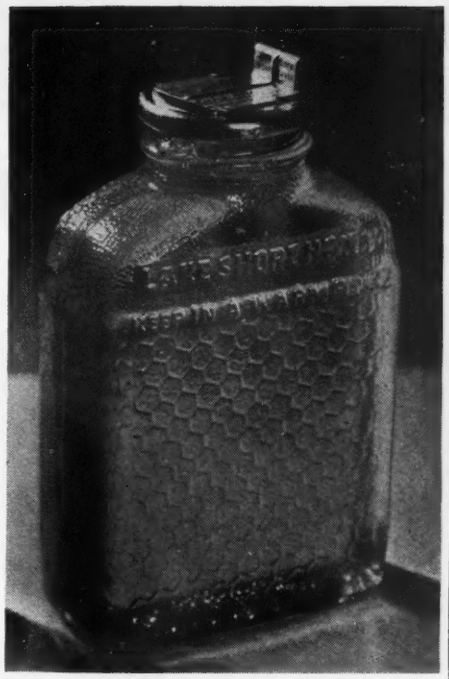


It can be used as a base for soups, as flavoring for gravies or meats, or as a drink when mixed with hot water. The extract is packed in semisolid form in a 2-oz. glass container with a white enamel screw cap.

One More Variety

"LAKE SHORE" strained honey, packed by H. J. Heinz Co., is sold in a square glass container having the appearance of a comb of honey, with a no-drip pouring spout.

Packing of honey is a new venture for the Heinz company, which has just completed an agreement with W. F. Straub & Co., Chicago, operators of the world's largest apiary on the Minnesota-North Dakota border. The company is installing honey-packing facilities at its factory in Muscatine, Iowa, and its nation-wide system of warehouses and sales branches will handle distribution of the product.



Substitute for Vanilla

IMITATION vanilla tablets, composed of lactose, corn starch, vanillin and coumarin, are the Army Quartermaster Corp's answer to its flavoring problem. Most of the Army's cakes, pastries and puddings need a dash of vanilla flavoring, but imports of vanilla beans have been cut, and the pure extract contains 35 percent alcohol, now classed as a critical material.

The new tablet, weighing 5 grains, is the equivalent of a teaspoonful of pure vanilla extract. It looks like an aspirin, and will disintegrate immediately in either hot or cold liquids, for use in the mess cook's mixing bowl. A complete fiber box of tablets, shaped like a cocoa box, contains 192 tablets.

Fruit Cereal

NEWEST product of American Dietaids Co., Inc., Yonkers, N. Y., is "Sunlets," a cereal-like mixture combining wheat germ, soybean, oat flour, flaxseed, raisins, apples, prunes, dates, brown sugar, vegetable shortening, salt and vitamin B_1. Cooked "Sunlets" are prepared with a cup of water or milk to which salt or sugar may be added. It may also be served cold with added fruits, and is recommended for children as a source of caloric energy. American Dietaids packs the product in a waxed envelope in an 11-oz. carton.

how to make

BETTER POTATO CHIPS

From the peeling and slicing of raw potatoes right down the line to finished chips, every operation is under push-button control on

FERRY CONTINUOUS POTATO CHIP MACHINES

Slicing, washing, frying, drying, salting and delivery to containers—all are automatic and continuous, with the result that the chips are uniformly better, all day and every day. None are underdone, burnt, rancid or greasy, and they cost you much less per pound to produce than by any other method . . . Be the first in your territory to adopt and cash in on the FERRY METHOD . . . Made in 6 sizes with capacities from 50 to 350 lbs. of finished chips per hour.

Write today for the complete data contained in Bulletin F. I.

J. D. FERRY CO.

129 South Cameron Street

HARRISBURG, PA.

"I'll bet if you men did the shopping . . . . .

YOU'D LOOK FOR VITAMINS TOO!"

That's why Enriched Foods are selling like hot cakes!

With America's 32 million housewives eager to buy vitamin-rich foods, it pays to enrich *now!*

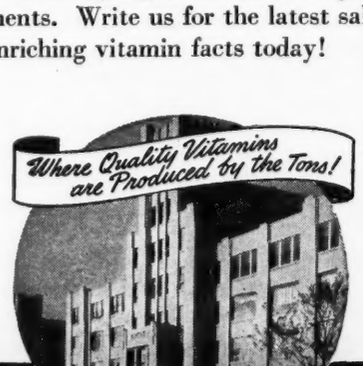
Smart food manufacturers are quick to realize that America's housewives are dead-in-earnest in their demand for vitamin enriched foods.

You have only to look at the sales of such enriched products as white bread, family flour, cereals, etc., to realize that sales of these products are skyrocketing as never before.

What enrichment has done for them, it can do for you. And since the cost of enriching today is down to a mere fraction of what it was, there's no better time than now to get this great selling force working for you.

You'll be amazed at how simple and inexpensive enrichment now is. So find out today which of your products can be enriched with the greatest sales advantage to you.

We will gladly advise you and give full technical information—how to enrich, the new low costs and the many benefits to you. We pioneered in vitamins and today are furnishing a high percentage of the nation's vitamin B_1, B_2, C and niacin requirements. Write us for the latest sales-enriching vitamin facts today!



Hoffmann-La Roche, Inc. VITAMIN DIVISION ROCHE PARK · NUTLEY · N. J.

First Food Distribution Order Restricts Bakers

Effective January 18, it changes many practices of bread bakers to effect wartime economies

Food Administrator Wickard's first Food Distribution Order, which became effective January 18, affects the entire baking industry. It discontinues the consignment selling of bread, places definite restrictions on the number of varieties, stops slicing for home consumption and provides that all white bread must be enriched to approved nutritive standards. Its purpose is to help prevent a rise in the price of bread, to conserve bread supplies and critical materials used by bakers, to make for more economical distribution, to save labor and equipment and to safeguard the nutritional value of bread.

The following are the restrictions placed upon bakers by Part b, Section 1404.1, of this Food Distribution Order No. 1:

1. No baker may perform the process of twisting, cross-panning, or dough-braking in the manufacture of any pan bread except that this restriction shall not be applicable to the baking of twin loaves.

2. No baker shall make or sell any sliced bread except that bread weighing two pounds or more per loaf may be sliced for a period of sixty days from the effective date of the order.

3. No baker may prepare or deliver any bread or rolls packaged in more than one thickness of wrapping material except as permitted by the provisions of paragraph (4), and except that double thickness is permitted on the areas of closure, and where necessary in the packaging of rolls with cardboard bottoms or ends, or cardboard trays.

4. No baker or other seller of bread shall use inserts, outserts, or end labels on any bread except that inserts and outserts may be used with unprinted wrappers where such insert or outsert provides the only label identification or required label correction, such insert or outsert not to exceed three inches in width, and except, further, that supplies of paper in the hands of bakers on the date of the issuance of this order may be used for providing inserts in connection with the wrapping of sliced loaves, to the extent that slicing is permitted under the terms of paragraph (2), until sixty days after the effective date of this order.

5. No baker or other seller of bread or rolls, baking company, its officers, agents, employees, subsidiaries, affiliates, or any person acting for or under subsidy from any baker or baking company shall sell on consignment, or shall deliver or otherwise distribute for sale any bread or rolls and agree in any manner to accept the return, resume possession, or give refund, credit, exchange, or allowance in connection therewith.

6. No baker shall make more varieties of bread or rolls than he made during the first week of December, 1942, and, in any case, the maximum number of varieties of bread and rolls which may be made or sold by any baker during any one week shall be (a week shall begin at 12:01 A.M. Sunday):

i. *Bread for sale to or distribution through retail stores* (not including multiple unit bakeries, restaurants, hotels and institutions). (a) Six varieties of machine molded bread, of which not more than three shall be white pan bread; (b) ten varieties of hand molded bread; and (c) three varieties of rolls.

ii. *Bread for sale to restaurants, hotels, and institutions.* (a) Ten varieties of bread, of which not more than three shall be white pan bread; and (b) nine varieties of rolls.

iii. *Bread for direct sale to consumers.* (a) Fifteen varieties of bread, of which not more than three shall be white pan bread; and (b) nine varieties of rolls.

The provisions of this order shall not apply to religious ritual breads when sold for and on the occasion of the religious holidays to which they are appropriate.

7. No baker shall procure, use, or cause to be used for his account, any new plates for printing of bread wrappers which require the use of more than two colors, or any new plates which cover more than twenty percent of the exposed area of the wrapper.

8. No baker shall provide or furnish racks, stands, or other equipment to any person, nor shall replace racks, stands or other equipment heretofore provided or furnished.

9. All white bread shall be enriched, shall contain not less than 3 parts nor more than 4 parts of milk solids to 100 parts of flour, and shall contain not more than 2 parts of shortening and not more than 4 parts of sugar or other related fermentable carbohydrate solids. All parts shall be determined by weight of material used.

Amendments

Food Administrator Wickard on January 14 announced minor amendments to Food Distribution Order No. 1 applying to bread and other bakery products. The order, as amended, becomes effective on January 18.

Under one amendment, bakers may continue to use the dough-brake process in making bread. Many small bakers without high-speed mixers have reported that they require the dough-brake unit for "finishing" the dough.

The regulation restricting the slicing of bread was extended to include rolls.

The provision limiting the slicing of bread to loaves weighing more than two pounds was clarified. It now specifies that the sale of sliced bread must be limited to restaurants, institutions and commissaries only for service with meals. The resale of sliced bread in loaves by such institutions is not permitted.

The requirement that all white bread contain not less than 3 nor more than 4 parts of milk was modified to permit manufacturers of French, Italian, Vienna and similar white bread (other than pan bread) to continue to produce these types without milk solids or skim milk for a period of 90 days. Little or no milk has been used in the production of these foreign-type hearth breads.

A second amendment (1) bans consignment selling of all bakery products; (2) permits the sale of sliced bread in 1-pound or heavier loaves until March 18 to restaurants or other institutions serving meals, and which accept a single delivery of not more than 20 pounds (under the original order slicing was restricted to 2-pound loaves); (3) prevents grocery, delicatessen and other stores from slicing bread for sale to their customers; and (4) eliminates the restrictions on the printing of wrappers for bread, rolls or other bakery products.

Wide World

FOOD RATION BOOK NO. 2

Harold B. Rowe, director of food rationing of the OPA, exhibits one of the new food ration books, No. 2, which is shortly to be used by consumers.

FDA Schedules Few Hearings

Wartime conditions preclude major activities on standards for food products

HEARINGS to fix standards by the Food & Drug Administration are not numerous, as wartime conditions preclude major activities in this field. But two important gaps in standards are to be closed and detail work on some of the major projects started a year ago will continue.

A brief hearing was to be held on January 26 to determine how the standard for sweetened condensed milk should be modified, if at all, to provide for the use of corn sirup as an optional ingredient. This amendment to the standard had been requested by Corn Industries Research Foundation on behalf of its industry.

Expected in the near future is a similar brief hearing regarding the use of corn sirup and corn sirup solids in jellies, jams and preserves. Both National Preservers' Association and Corn Industries Research Foundation request the privilege of use of these optional ingredients without label declaration. Industry spokesmen are expected to request that privilege on condition that certain upper limits for the use of these ingredients be provided in the standard.

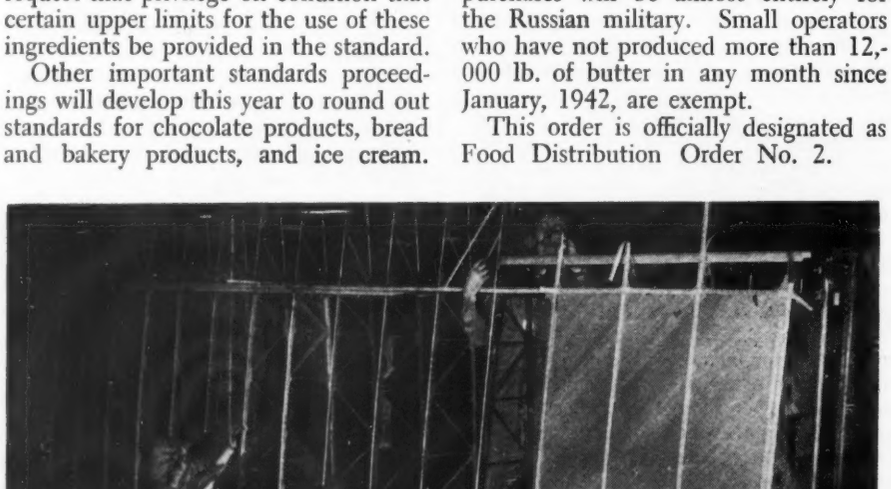
Other important standards proceedings will develop this year to round out standards for chocolate products, bread and bakery products, and ice cream. The major hearings on those three commodity groups were held many months ago. There has been some talk that carbonated-beverage standards might be the subject of a hearing, but it now seems unlikely that another such major case will be started by F&DA until these cases now under consideration near completion.

The shortage of manpower in both legal and technical divisions of F&DA restricts activity there. Furthermore, it is recognized that the holding of extensive hearings is unreasonably burdensome on industry during the war period unless a major public benefit can be demonstrated for a new standard.

Creameries Must Set Aside 30% of Butter

AS A MOVE to obtain sufficient supplies of butter to meet the needs of the armed forces and for minor export to allied nations, Food Administrator Wickard on January 6 directed manufacturers of creamery butter to set aside 30 percent of their monthly production for direct war requirements, beginning February 1. It is expected that more than two-thirds of the butter set aside will go to U. S military forces, and the balance of government purchases will be almost entirely for the Russian military. Small operators who have not produced more than 12,000 lb. of butter in any month since January, 1942, are exempt.

This order is officially designated as Food Distribution Order No. 2.



Wide World

FROM PICKLES TO PLANES

Parts of plywood airplanes and gliders are being made for the Army by H. J. Heinz Co., Pittsburgh. A section of the plant formerly used as a warehouse was converted in three months to a war production unit. The picture shows women workers fabricating the inboard section of a wing, one of the final assembly operations. Wings, fuselages and tail assemblies are made.

Food Research To Be Speeded

Intelligent substitution of relatively abundant foods for scarce ones must be planned

FOOD RESEARCH by government and industry will be greatly speeded as an aid for eliminating food shortages. Intelligent and proper substitution of relatively abundant foods for those more scarce must be planned factually. Fundamental research which can be done quickly, and a great deal of engineering development with industry, are, therefore, contemplated by government executives.

To avoid complication, overlapping, and gaps in the program, plans have been laid for close coordination of Army, Navy and Agricultural Department efforts. New staffs are being named and a new top technical organization put together in each of the three departments having major interest. The military results will be important also for civilian purposes; and plans will be closely coordinated with those of Agricultural Research Administration directed by Dr. E. C. Auchter.

Completion of the research organization has been slowed a little by difficulties in securing a program in the two "action" agencies, Food Production Administration and Food Distribution Administration. But these were cleared fairly well during mid-January and aggressive plans for research organization authorized by Secretary Wickard for direct ARA handling by Dr. Auchter. Assisting him will be Dr. Charles G. Woodbury. An industry advisory committee was also authorized.

Cooperation Suggested

Any food unit which can suggest ways for alleviating food shortages by new methods or new materials will be urged to confer with Dr. Auchter or his staff whenever additional research or engineering development work are required before commercialization. But there is no desire in official circles to take over either the planning or active directing of research which industry can do. The only request is that the government be kept generally advised as to plans wherever feasible, in order that mutual aid may be furnished wherever this will speed the work.

Cheese, Macaroni Standards

STANDARDS of identity for cream cheese, neufchatel cheese, cottage cheese and creamed cottage cheese were recently promulgated, effective March 23, 1943. After the hearing on December 17.

USDA Photograph by Knell

RESEARCH ADVISOR

A food industry man was brought into the Department of Agriculture organization when Dr. Charles G. Woodbury was appointed special assistant and advisor to Dr. E. C. Auchter, Agricultural Research Administrator. Dr. Woodbury left his post as a director of raw products research for National Canners Association to accept the appointment. He knows the problems of the food processor and producer. He spent 14 years in research at Purdue University's experiment station and 22 years with NCA. Authority to develop broad research programs and put them into operation goes with his new appointment.

standards for macaroni and noodle products were proposed, although no action has been taken on the findings of fact. Foods that may be affected by the proposed standards include: macaroni products, milk macaroni products, whole-wheat macaroni products, wheat and soy macaroni products, vegetable macaroni products, noodle products, wheat and soy noodle products and vegetable noodle products.

Production of Frozen Desserts Restricted

FOLLOWING the December WPB edict limiting production of frozen dairy foods, manufacturers of frozen desserts faced another sharp cut in output when Wickard issued Food Distribution Order No. 8 on January 19. The order, effective February 1, restricts the use of milk and milk products for civilian production to 65 percent of the quantities consumed from December 1, 1941, to November 30, 1942.

It is estimated that milk saved from ice cream production will make 97,500,000 lb. of butter and 68,000,000 lb. of dry skim milk a year for domestic, Army and Lease-Lend use.

A vital link in NABISCO'S efficient production

Attractive, sales inducing wrapping for a great variety of NABISCO products is produced by our Model F carton wrapping machines.

The name NABISCO has become a "buy word" wherever crackers are sold . . . No overnight achievement, this strong public confidence has been attained through a consistent policy of product improvement, backed by manufacturing efficiency vigilantly maintained at every step of the manufacturing process.

Automatic wrapping forms a vital link in this ideal production set-up. So we believe it is significant that large numbers of Package Machinery Company machines have been in the service of Nabisco ever since our Company was founded. And, like other leaders in the package goods field, National Biscuit Company has shown its approval of our machines by constant re-orders for additional improved equipment . . . Something to remember when wrapping machines can again be freely delivered, and you will be seeking the best and most advanced machines.

We are ready now to put our Engineering and Designing Department to work on any ideas you may have for post-war packaging improvement.

Consult our nearest office

PACKAGE MACHINERY COMPANY
Springfield, Massachusetts
NEW YORK CHICAGO CLEVELAND LOS ANGELES TORONTO

Our Model F bundling machines bundle the cartons in dozen lots. Fed automatically from the cartoning machines, these bundlers make a large saving in packing costs.

PACKAGE MACHINERY COMPANY
Over a Quarter Billion Packages per day are wrapped on our Machines

Dried Egg Production Will Be Increased

INCREASED production of dried eggs to meet expanding wartime requirements is desired by the Food Distribution Administration, and government representatives are meeting with prospective manufacturers of dried eggs in several states as a move toward attaining this increase.

Although the normal output has increased more than 40-fold since 1941, production at present capacity will fall short of total requirements anticipated for the next few months for all military and allied uses and domestic needs. About 90 plants are now operating in the United States, and with the new ones now under construction, capacity production will be close to 400,000,000 lb. a year, compared with a prewar production of 6 to 10 million pounds annually.

British Refrigerate Ships

To help bring her the vital refrigerated foodstuffs she needs, such as meat, butter, bacon and eggs, Great Britain recently converted or redesigned a number of ordinary tramp steamers into refrigerator ships to augment the regular refrigerator ships serving her war needs. The converted tramps have between 250,000 and 300,000 cu. ft. of refrigerator cargo space, compared with 500,000 cu. ft. of cargo holds in a typical 520-ft. cargo liner. The boilers in these ships have been stepped up in capacity to provide steam for the refrigerating plants.

TO KEEP 'EM ROLLING

Operating one of the largest truck fleets in the United States, the Borden Co., New York, is putting U. S. Truck Conservation Corps. pledges on its vehicles. Gulf Oil Corp. has supplied Borden with 6,800 of the decalcomania pledges.

OPA Regulations

Canned Chicken, Turkey—OPA on Jan. 5 revised its original order MPR-262 in regard to ceiling prices for canned boned chicken and canned boned turkey. A new formula for computing prices has been developed to cover the different container sizes of the products.

Frozen Fish—Ceilings for wholesalers of Canadian smelts sold in this country were established on Jan. 15 at levels which generally reflected the average of sellers' individual March, 1942, maximums. MPR-303 may result in an improved retail distribution of the smelts, and should prove of particular significance in light of the meat shortage.

Flour—MPR-296, issued on Dec. 30, fixes a ceiling on flour from wheat, semolina and farina sold by millers and blenders. Under MPR-280, which the new order supersedes, flour was frozen for each individual miller at his own maximum prices. The resulting dislocation in the milling industry made necessary the new regulations, in which maximum flour prices are based on maximum wheat prices of 89 percent of parity for all wheats except soft red winter wheat.

Retail Foods—Nine commodities were directly affected by OPA's amendment 7 to MPR-237, issued Jan. 8, which established new and uniform margins for retailers and wholesalers in certain food commodities. The foods include coffee, all canned fish, cooking and salad oils, hydrogenated and other shortenings, corn meal, canned citrus fruits and juices, evaporated and condensed milk, pure maple sirup and pure corn sirup, flour and flour mixes. Each storekeeper will apply the uniform mark-ups to his net cost to get his dollars-and-cents maximums.

Citrus Fruits—Maximum prices for citrus fruits—grapefruit, lemons, oranges, tangerines and temple oranges—grown in the four principal citrus producing states, were established by MPR-292, issued Dec. 31, to promote orderly distribution of the fruit at fair prices. The ceilings vary as to area of production, season of the year and type of packing. In general, the maximum prices will change seasonally on the various citrus fruits two or three times a year, following the customary price pattern.

Sugar Cane Sirup—Fixed ceilings on sugar cane sirup at all levels of distribution prior to wholesale and retail were announced on Dec. 28, supplanting individual March, 1942, maximums. The action raises ceilings for Georgia (or country type) cane sirup approximately 18 cents per gallon to cover increased costs occurring in the 1942 season. OPA also set specific dollars-and-cents ceilings on Louisiana (or large mill type) cane sirup which reflect the average March, 1942, sales level.

Corn—An order issued Jan. 12 by OPA slaps ceilings on corn prices in all exchanges and in every cash and local market at the highest levels at which sales were made on Jan. 11. The order is designed to halt

The VIKING PEELER

Essential Equipment for CANNERS and DEHYDRATORS of

White Potatoes — Horseradish
Sweet Potatoes — Radishes
Carrots and Beets — Turnips and Yams

• OPERATION

Peels and washes—and drains peelings—all in one operation; belt or motor driven.

• CAPACITIES

50 to 60 lbs. per minute—1,000 lbs. per hour
70 to 75 lbs. per minute—1,400 lbs. per hour

• ECONOMY

Waste reduced to absolute minimum—and recoverable for cattle feed. Most economical in first cost, operation, maintenance and space.

FEATURES

1. Heavy bronze removable sleeve bearings.
2. Cut bevel gears, 4 Pitch.
3. 10" dia. thrust bearing running in oil.
4. Genuine carborundum abrasive FUSED onto entire inner surface of peeling Hopper and upper surface of revolving Disc. Abrasive cannot be torn by foreign material in Hopper.
5. Moulded one piece rubber gasket guaranteed water-tight for the life of the machine.

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Contractors to:

U. S. Navy Department; U. S. Army Medical, Quartermaster & Engineer Corps; U. S. Dept. of Justice; U. S. Veterans Bureau; U. S. Marine Corps; Civilian Conservation Corps; State, County and Municipal Governments.

further sharp increases in America's largest crop and basic feed for hogs. The ceiling, which is expected to raise meat production, is a temporary 60-day regulation, to be superseded by a permanent regulation which will continue the levels frozen by the action and will be based on $1.00 a bushel for No. 2 yellow corn in Chicago.

Canned Tuna—Rising prices of tuna, bonito and yellowtail invoked action of OPA in MPR-299, issued Jan. 7. The maximum prices established by the order are not below the average price of such commodities in the year 1941. The ceiling prices, graded to the style of container, are maximum prices per case f.o.b. car at the shipping point nearest the cannery.

Army Field Rations—Pending further standardization of Army field rations, OPA on Jan. 1 announced extension until April 1, 1943, of the period of temporary exemption for these products from price control. Amendment 3 to MPR-156 and amendment 16 to Revised Supplementary Regulation No. 4 cover Army field rations B, C, D, J, K and M; Mountain ration, 5-in-1 ration, Bail-Out Ration, Rations 1, 2 and 3 (12-oz. cans); corned beef hash (5½-lb. can), meats and vegetable stew (30-oz. can) and chili con carne (6-lb., 8 oz. can.)

Dairy Products—One of the most significant of recent OPA regulations was MPR-289, effective Dec. 30, 1942, which brought butter, Cheddar cheese, evaporated milk and bulk powdered skim milk under uniform price curbs on sales except at retail. The new fixed maximums, applicable generally at processor and wholesale levels only, replace ceilings representing each individual seller's peak prices from September 28 to October 2, 1942, and in a large measure reflect the average of prices during this period. Scaled at price levels to encourage production of essential dairy products, the new regulation also is a step toward equitable distribution of the products to all sections of the country. Housewives may expect simplification of retail price control on these four commodities in the near future.

Amendment 1 to MPR-289, issued Jan. 11, establishes zones for price control on delivery of evaporated milk, and clarifies the method of determining maximum selling price for manufacturers of "packaged type" butter.

Townsend Made Head Of Food Production

Food Administrator Wickard's organization has already suffered a major casualty. Herbert W. Parisius has retired as director of the Food Production Administration and is succeeded by M. Clifford Townsend. J. B. Hutson, on leave from CCC, is Townsend's chief assistant, while A. G. Black, Farm Credit chief, is associate director along with Hutson. D. A. Fitzgerald, who has been with the Department of Agriculture more than 20 years, is deputy director.

Available for 24-Hour Duty at Your Plant

the HTH "Sanitation Squad"

● Today packers and manufacturers of food products—dairies, meat packers and other important producers—are more careful than ever to prevent spoilage losses. The plain truth of the matter is that bacterial contamination hurts the war effort by detracting from the sum total of food production.

You can guard against this invisible menace in your plant with HTH products—HTH, HTH-15 and Lo-Bax. They are full-strength chlorine sterilizers in convenient dry form. When added to water, they form dependable, fast-killing hypochlorite solutions that make short work of bacteria. What's more, HTH Products not only minimize spoilage losses . . . but they safeguard the purity and quality of your food products. And they're as economical as they are effective. You can use them freely to flush, spray or wipe all surfaces with which food and beverages come in contact; also for general sanitation throughout the plant.

HTH Hypochlorite solutions are an effective germicide for use on floors, in locker rooms and cafeterias.

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War Production Board Orders

Wine Bottles—WPB, in Schedule D to Limitation Order L-103, issued January 1, substituted straight-side four-fifths pint and quart size wine bottles for the tapered bottles of similar sizes. Effective March 1, 1943, the order standardizes glass containers for certain products; the amendment provides definite sizes and designs for the straight-side bottles, following the general pattern of the tapered bottles.

Ice Cream—Ice cream production for January was further reduced in an amendment to Order M-271, effective January 1. The new order, necessary because of the critical milk shortage, reduced the amount of base butterfat and milk solids that could be used in that month to 50 instead of 60 percent of the amount used in October of last year. A permanent order to supersede Order M-271 is expected soon.

Malt Beverage Containers—The manufacture of glass containers for beer and other malt beverages was further limited in Schedule B to Order L-103, issued Jan. 4, when containers were limited to the following capacities: 12 fl. oz.; 1 qt.; and one-half gallon. No container may be manufactured with a glass weight heavier than the following: one-half gallon capacity—not more than 39 oz. avoir.; quart capacity—not more than 30 oz. avoir.; 12 fl. oz. capacity—(a) in the "steinie" shape, not more than 10½ oz. avoir., (b) in the "export" shape, not more than 12 oz. avoir. No mold for a glass container may be replaced except by a mold which conforms to the specifications of a standard glass container for malt beverages.

Can Enamel, Drum Coatings—Conservation Orders M-108, M-116 and M-158, governing the use of can enamel, closure enamel and drum exterior coatings, were revoked on Dec. 17 by order of the Director General for Operations. These orders restricted the use of the following materials, all governed by allocation orders: tung oil, oiticica oil, castor oil, phenolic resins, para-phenylphenol resins, alkyd resins, vinyl resins, ethyl cellulose and nitrocellulose. Natural resins are subect to Conservation Order M-56.

Cloves and Ginger—Improvement in imports has increased the supply of cloves and ginger for packers, wholesalers and industrial users, under terms of Supplementary Order M-127-b, amended on January 4. At the same time a reduction in imports made it necessary to cut further the quota of cassia (cinnamon), and no changes were made in the quotas of the other spices covered by M-127-b.

Canners' Stock—An amendment to Order M-237 issued Jan. 7 by WPB removes the restriction that this order placed on sales of canners' stocks for civilian consumption. Canners may now sell and make shipment to wholesalers and jobbers who are eligible, under the amendment, to receive shipments. The amendment does not increase the amount of restricted canned foods a wholesaler or jobber may deliver to his customers, but it permits him to accept enough canned foods beyond his quota to keep inventory at 25 percent of his base figure.

Storage Butter—Approximately 2,000,000 lb. of storage butter which were frozen in the 35 principal markets of the United States by Order M-267, issued Nov. 21, were released for civilian consumption on Dec. 31. However this butter was not expected to relieve the current butter shortage as it is only a small percentage of the normal weekly butter consumption in the country.

Paperboard Boxes—Several types of food are among the products that may be sold at retail packaged in new paperboard boxes under Limitation Order L-239, issued Jan. 8. Restrictions in the use of paperboard for packaging are expected to save 225,000 tons of paperboard to be used in making containers for essential products. The order affects the use of boxes for the following products: butter, lard, oleomargarine, ice cream, crackers, baked goods and beverages.

Food Coloring—Use of annato or annato extracts has been restricted exclusively to coloring food products, in Order M-103, amended Jan. 1. Current supplies of annato, imported from Latin America, are sufficient only to meet food requirements and the dye may not be used to color textiles or to manufacture pigments.

Shipping Bags—Order M-221, amended Jan. 13, places control over textile and paper shipping bags used for packing foods, chemicals, seeds and other specified products. Beginning April 1, 1943, manufacturers of beans, foods, flour meal or cereals, nuts, potatoes, rice, seeds, starch or sugar were restricted to use of the following size containers (based on weight of contents): 2-lb., 5-lb., 10-lb., 25-lb., 50-lb. and 100-lb. Potatoes may also be packed in 15-lb. bags to facilitate distribution.

Canned Fish—In an amendment to Supplementary Order M-86-b, issued Dec. 24, no canner after that date was permitted to sell or deliver any part of his pack of salmon, pilchard, herring or mackerel that was packed between March 1, 1942 and Dec. 24, 1942, except as follows: 80 percent by weight of pilchard, herring or mackerel, and 60 percent by weight of each canner's salmon pack, must be sold to government agencies in these quota periods—March 1, 1942 to Dec. 31, 1942; and the months of January and February, 1943.

Tea—A shortage in the supply of tea made necessary an amendment to Order M-111, issued Jan. 7, restricting existing inventories of tea and setting up quota periods for the sale of the commodity. Under the quotas, no packer may accept or deliver, and no wholesale receiver may accept delivery of, more tea during the determined period than his total quota for that period.

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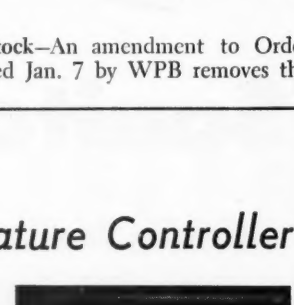
Capacitrols have often paid for themselves during a single production cycle. The famous "Electronic Principle" Control employed in Wheelco Controllers eliminates the faults inherent in all other types of controllers. Only Wheelco Controllers can give you instantaneous control combined with extreme accuracy of temperature measurement. Write today for the free Bulletin which gives detailed description of this controller.



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HEADS ABA

Ralph D. Ward, Drake Bakeries, Brooklyn, N. Y., has been reelected president of American Bakers Association. Other officers were also reelected, including G. C. Patton, chairman; Louis Garttner, first vice-president; Joseph Hexter, second vice-president; and M. Lee Marshall, treasurer.

More Cans for Soups, Meats

WPB authorizes packing of 4 million cases more of canned soups during 1943

In an amendment to Order M-81, issued January 13, WPB authorized the packing of an additional 4,000,000 cases of canned soups in metal cans for the armed forces, Lend-Lease and civilians during 1943. The amendment also fixes for the first time the amount of metals (steel and tin) a packer may use in canning certain meats and meat products for civilians in 1943.

The Provisions

Soup canners may now use unlimited quantities of cans for packing seasonal soups, including asparagus, pea, spinach and tomato soups and they may use 75 percent of the cans used in 1942 to pack nonseasonal soups. As a result of the increase, the cans provided for canning of soups will raise the 1943 pack to an estimated total of 19.2 million cases. A packer may use 100 percent of the tinplate or blackplate used for packing chile con carne, meat loaf, meat spreads, sausage in casings, bulk sausage and potted meats in 1942, plus 75 percent of the tinplate and blackplate used for canning luncheon meat.

The amendment to Order M-81 also permits canners to pack oysters in metal cans until April 30, 1943, and to pack baking powder in fiber cans with metal ends until June 30, 1943.

Every Minute Saved in Maintenance . . . Means More Productive Hours

And these husky "King-clip" valves are doing just that . . . saving those precious minutes that add up to more productive time. With "King-clips" on the job, maintenance is cut to a minimum . . . users are assured of a practically permanent installation, free from the hundred-and-one "valve headaches".

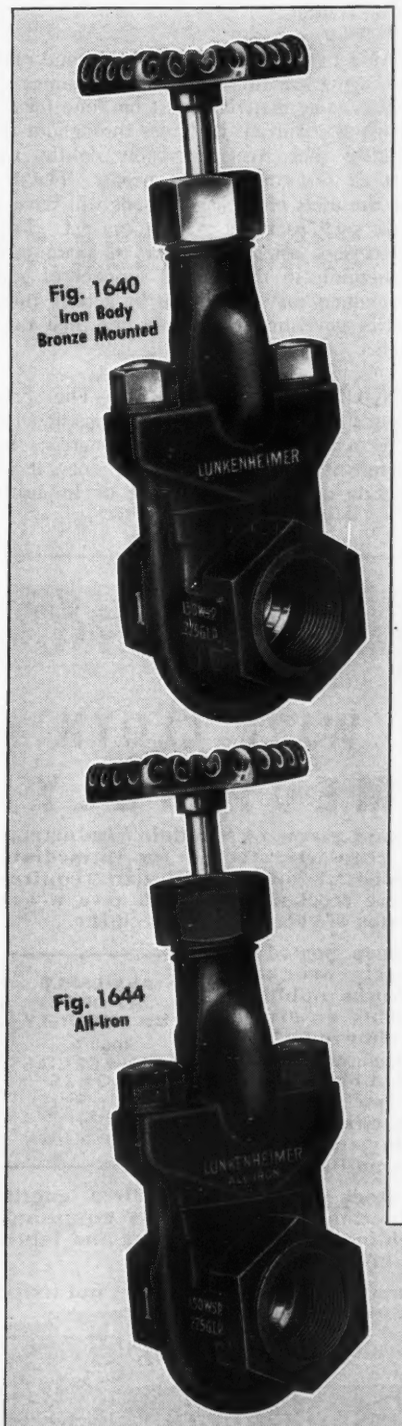

Fig. 1640 Iron Body Bronze Mounted

Fig. 1644 All-Iron

"King-clip" Valves are doing their part in another respect, too . . . in conserving critical materials. Since only the working parts are made of bronze, these iron body valves use less copper, tin and other scarce materials than all-bronze valves, and they perform equally as well on many services.

And here's an important point . . . you are likely to get better deliveries on "King-clips" than on the scarcer all-bronze valves. The complete facilities of Lunkenheimer distributors are at your service. They'll go out to help you get the things you need.

●

Since virtually all materials used in the manufacture of valves are on the list of critical materials, valve users are urged to furnish the highest possible preference ratings and proper "end use" information on their orders. This will be of mutual helpfulness.

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Bronze, Iron and Steel Valves, 125 to 2500 lb. S. P. for all Industries; Boiler Mountings, Lubricating Devices, Aircraft Fittings

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CAPITAL VIEWS

BIG BUDGET—The President's budget message estimates spending at $109 billion for the next fiscal year. No one knows what a billion dollars is, much less a hundred billion. But Uncle Sam will spend it and the food industries will pay now and later a big chunk of the total in their tax bill.

PACKAGING ECONOMY—Savings effected by shifting coffee from tin to cheaper containers must be passed on to the retail customer. Thus the OPA continues to emphasize that efficiency in business is to be discouraged, even when the public is the gainer. Incidentally, plenty of Congressmen know that too many professors do not make for a good Administration. It is expected (and most food men hope) that some hundreds of these professors, economists and lawyers will give way at OPA to a few folks who know something about the foods that they are dealing with.

RUBBER VS. FOOD—The synthetic rubber program is far behind schedule. This is a military fact, but not a military secret. One consequence is that more rubber must be made from alcohol; and the alcohol must be made to some extent from food. Thus the one commodity likely to be abundant (cereals) is raided to make up for technical deficiencies and official blundering. Mr. Jeffers is trying hard to get action; but bureaucrats still get in his way rather effectively. When some Americans are a bit more hungry than necessary, perhaps a year from now, they will be quite fond of these officials who have prevented the use of business methods in dealing with the rubber program. Food executives can well keep records of just what happens so that they may tell the public the whole truth when the more critical days come *next* Winter.

CANS FOR THE ARMY—More and more packaging in tin cans and containers of other scarce materials must be done for the Army as it spreads its forces throughout the world. The Army, probably rightly, will get all the containers it needs. The rest of the users of packaged foods will have to take such packages as they can get. Food processors who would like to share more generously in the limited supplies of good containers may best do so by getting themselves government contracts for their products.

INQUISITIVE CONGRESS—The President's message of January 6 suggested that this may be a peace-making Congress. But before it earns that title, if it does, it will rightly deserve also the title of Inquisitive Congress. The present session is starting more investigations of official activities than in any other recent year. Many of the investigations will lead to the question "Who is to Blame?". Some of the food industries are likely to be targets for attack. They know this already in most cases. They necessarily will get ready to defend themselves, which is not going to be a pleasant task as much mud slinging seems inevitable.

QUESTIONNAIRES—Unless the Budget Bureau authorizes questionnaires sent to industry for statistical facts, it is no longer necessary for business men to answer the numerous and burdensome questions. This is not quite literally true. But it is near enough true to give some comfort to those greatly overburdened in the past.

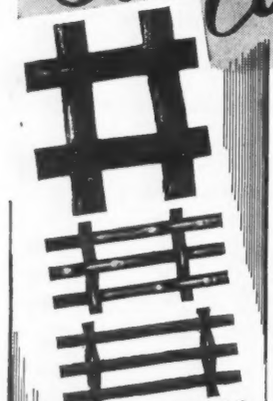
FOOD SAVING—The Army and the Navy have discovered that a little less prodigal use of food is important. It is important because the civilians will not otherwise have enough—and it may be that they will not have enough anyhow. And it is important also for military leaders to demonstrate to the public that they know how to feed our soldiers and sailors well with a minimum of waste. Thus high military executives have a selfish interest, as well as a public-spirited motive. This is fortunate.

"FRILLS"—Bakers must do away with sliced bread and other "frills". The saving which may be accomplished by fewer varieties, fewer sizes, and less slicing of bread will be welcomed by the baking industry even though it sacrifices some of its favorite methods of cultivating public favor. But it is hard to see how some of the advances made by food technology recently can rightly be called "frills". Naturally, those in official life who do not understand our problems are rather successful in this sarcastic characterization. This is unfortunate, but probably inevitable. Later on, food technologists will rebuild the best methods and provide the best service of which they are capable. At present, we must "go along" with official dictum, even when it hurts us and helps nobody.

COST REVIEW—A firm supplying manufactured food to the government at a loss is not helpless even though it has a fixed-price contract with Uncle Sam. Firms so suffering may ask the Quartermaster Corps or other government agency for a cost review. There are a few folks in high official places that realize the necessity for this. And in some cases relief can be had from contracts found suddenly to be burdensome. This is as it should be. It is unfortunate that recalculation of costs and prices is not a little bit easier in these days of constantly rising costs.

DISAPPOINTED ZEALOTS—Those who have boosted enriched flour and enriched bread have been disappointed in the lack of public acceptance. They are discovering that an uneducated public is unable to cooperate adequately. They thought that by a few arbitrary rulings they could accomplish their ends without stopping to teach Mrs. Housewife what it all meant. And, incidentally, some overenthusiastic individuals overstated certain claims badly.

Of Course you can get



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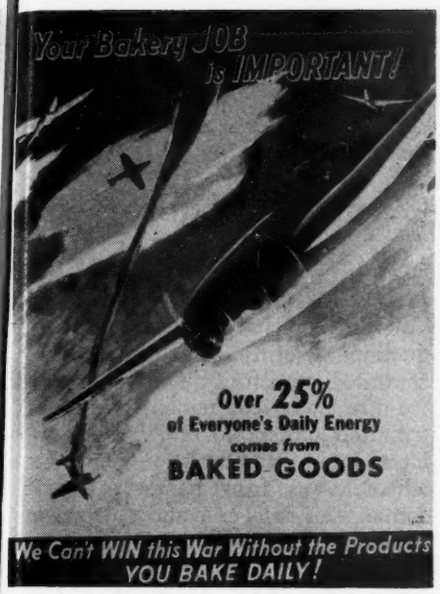
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Over 25%
of Everyone's Daily Energy
comes from
BAKED GOODS
We Can't WIN this War Without the Products YOU BAKE DAILY!

FOOD WORKERS IMPORTANT

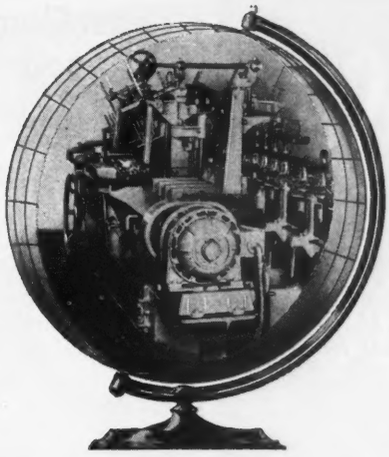
There is no doubt about the importance of food in the war program, but executives must point this out to employees if they are to avoid losing many of them to plants making tanks, planes, guns and other direct implements of war. Posters, printed matter, contests, slogans and pep meetings can be used to this end. Above is one of a series of posters prepared by Doughnut Corp. of America to do the job for the baking industry.

Use of Cellophane Curtailed Further

FURTHER curtailment in the use of cellulose film (cellophane) took place in January. Included in the long list of foods denied the use of cellophane are flour, sugar, candy box overwraps, peas, beans, macaroni, noodles and similar paste goods, dessert and drink powders. The baking industry must reduce its use of cellophone 10 percent. Cellulose caps and bands are permitted when used in place of metal tops as closures for foods packed in glass.

81 Dairies Adopt Mileage-Saving Plan

ODT on January 8 approved a joint-action plan for every-other-day retail milk delivery by 81 dairy companies in Cleveland, Ohio. Under this plan, which will remain in effect for the duration, dairies also are prohibited from making delivery to any customer who has received a delivery of dairy products from any of the other companies during the previous 48 hours. This plan is expected to effect a substantial reduction in retail delivery truck mileage for the 81 companies cooperating in it.



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Yeast Committee Appointed By Brewers

In keeping with wartime demands, brewers convened in Chicago, January 11-13, for a meeting "stripped down to essentials." This convention was jointly arranged by U. S. Brewers Association and Brewing Industry Foundation.

The first day was devoted to public relations problems under the auspices of the Foundation. Means of combating prohibition propaganda, cooperation with governmental agencies in the Army and Navy camp program and industry advertising formed the main points of discussion. Probably the most important step taken was the formation of a brewers' yeast committee to "foster industry cooperation with governmental agencies developing the use of brewers' yeast as a nutrition supplement for war workers and men of the armed services." The chairman of this committee is E. A. Schmidt, C. Schmidt & Sons, Philadelphia.

Much will be heard in the near future on the possibilities of brewers' yeast in the preparation of meatless foods and for food fortification with the vitamin B complex. Food processors will do well to watch developments in this respect.

Citrus Juices Reserved And Fruit Set Aside

Early in January, Food Administrator Wickard directed that the entire production of citrus juices, except unconcentrated grapefruit juice, be reserved for direct war requirements (Food Distribution Order No. 3). And a week later he put into effect a program under which citrus fruit handlers in California, Florida, Texas and Arizona may be required to set aside specified quantities of citrus fruit for processing. The latter order (Food Distribution Order No. 6) covers lemons, grapefruit, limes and all varieties of oranges except tangerines. The quantities of each fruit to be set aside by handlers will be determined by the Director of Food

(Continued from page 77)

Product	1943 packing quota	Closure material indicated by X: Tin-plate	Black-plate	Rubber
FISH AND SHELLFISH				
1. Clams, soft, hard, or razor	100% 1942	X	..	X
2. Clam broth	100% 1942*	X	..	..
3. Crabmeat	100% 1942	X	..	X
4. Fish flakes, except dried fish flakes	100% 1942	X	..	X
5. Fish, pickled	Unlimited	X	..	..
6. Fish pastes, including shellfish paste	100% 1942*	..	X	..
7. Lobsters, including spiny lobsters	100% 1942*	X	..	X
8. Oysters	100% 1942	X	..	..
9. Shrimp	100% 1942	X	..	X
SOUPS				
Seasonal: Limited to soups which shall contain not less than 7 percent, by weight, of dry solids; from any one or more of the following fresh unfrozen vegetables: asparagus, peas, spinach, tomatoes.	Unlimited	X	..	..
Non-seasonal: Limited to the following kinds of soup which shall contain not less than the specified percentage, by weight of dry solids from fresh, brined or frozen vegetables, meats, or other products listed in Schedules I or II, in Order M-81, provided that no person shall use for packing such soups, more than 35 percent by weight, of the frozen vegetables which he used for this purpose during 1942	75% 1942*	X	..	..
MILK AND DAIRY PRODUCTS				
1. Cheese spreads, processed	100% 1942	X	..	..
2. Cheese spreads, unprocessed (e. g. limburger)	100% 1942	X	..	..
3. Condensed milk, sweetened, as defined by the Federal Security Administration, July 2, 1940, paragraph 18,525 page 2444, Federal Register, and 18,530, page 2445, as amended, Federal Register, August 8, 1941, pages 3973 and 3974	100% 1942*	X	..	..
4. Cultured milk—"Cultured milks" as classified herein refers only to those cultured or fermented milk or skim milk products which develop pressure within the container (glass bottles) due to fermentation which is produced by the addition of certain materials to milk or skim milk such as sugar, yeast, cultures, and the like	100% 1942	..	X	..
5. Fluid milk, with or without flavoring. Quota: Until 3/1/43 100 percent, and until 6/30/43 50 percent of corresponding period of 1941	See product column	..	X	..
6. Ice cream mix, dry. Packing quota includes pack required to be set aside by any order of the Director General for Operations for purchase by government agencies	50% 1942*	X	..	X
7. Malted milk, including chocolate milk, dry	Unlimited	..	X	..
SYRUPS AND HONEY				
1. Syrups—blended, bottlers, cane, corn, maple, molasses, sorghum, malt	100% 1942*	..	X	..
2. Chocolate or cocoa syrup	100% 1942*	..	X	..
3. Honey	Unlimited	..	X	..
OLIVES, PICKLES, RELISHES, CONDIMENTS AND SAUCES				
1. Pickles, piccalilli, and relishes	100% 1942	X	..	..
2. Mustard	100% 1942	X	..	..
3. Green olives	100% 1941	X	..	..
4. Horseradish	100% 1942	X	..	..
5. Sauces—beefsteak, cooking, soya, tobasco, and worcestershire	100% 1942	X	..	..
EDIBLE OILS AND DRESSINGS				
1. Dressings—Mayonnaise, Russian, salad and Thousand Island	125% 1942	..	X	..
2. French dressing	100% 1942	X	..	..
3. Oil, edible liquid	125% 1942*	..	X	..
4. Sandwich spread, other than meat spreads	125% 1942	..	X	..
5. Tartar sauce	100% 1942	..	X	..

(Turn to page 98)

"It'll take the country by storm. The packing date is stamped on each grain."

Distribution on the basis of a percentage of fruit shipped by the handlers during specified periods. The fruit set aside may be sold at any time to a processor or any government agency for processing, or may be processed into juice by the handler subject to existing orders relating to such processing.

The purpose of the set-aside order is to effect maximum utilization of existing facilities for the production of citrus juices for war requirements.

Revises Tentative Grades for Poultry

PROVIDING the official basis for grading under the price ceiling system, revised tentative standards for classes and grades of dressed chickens and wholesale grades were announced on January 11 by the Department of Agriculture. The standards for classes and grades for dressed chickens have been established by the Food Distribution Administration.

The new standards and grades, and wholesale grades for dressed chickens, provide for grade classification and weight specifications for broilers, fryers, roasters, stags, capons, fowl and cocks. The grade classifications are designated by the letter symbol "U. S. Grade AA," "U. S. Grade A," "U. S. Grade B" and "U. S. Grade C."

Only those dressed chickens graded by licensed Federal or Federal-State graders can be marked or tagged with official grade designations. OPA regulations provide, however, that grading may be done by producers, handlers or dealers and that the unofficially graded birds can be marked or tagged "Grade A" or "Grade B," as the case may be, if they conform to the grade represented.

IF YOU ARE Dehydrating

MEAT
VEGETABLES
FRUITS
SOUPS EGGS
DAIRY
PRODUCTS

Let OAKITE CLEANING & SANITATION METHODS HELP YOU PROTECT PRODUCT QUALITY

Among the many factors in the dehydration of foods that may and CAN affect their flavor, nutritive value and keeping quality... is neglect to carry out strict rules of sanitation and cleanliness. Particularly does this apply to processing and handling equipment.

Using incorrect methods or materials to remove various contaminating deposits from equipment usually causes trouble, spoilage.

It is why we say... take advantage of wide, practical Oakite experience in food plants. Over 60 different, specialized Oakite materials are available, one or more of which will help you maintain QUALITY CONTROL more easily... that will satisfactorily meet your specific cleaning requirements with the speed, thoroughness and economy called for by your production schedule.

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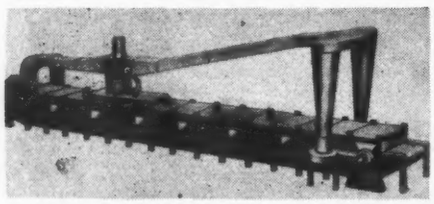
OAKITE TESTED CLEANING
MATERIALS & METHODS FOR EVERY CLEANING REQUIREMENT

DEHYDRATION SLICES CUBES STRINGS

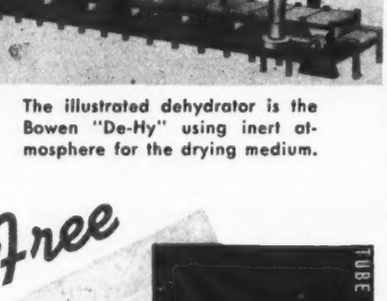
The new Bowen "De-Hy" will reduce vegetables, meats, fish, etc. to a dry product that is free from case-hardening. The inert drying atmosphere is automatically held at the correct operating temperature and can easily be adjusted for any type of product. Investigate the "De-Hy"—a new informative 12 page booklet showing typical flow charts for most common foods, illustrations of Bowen units and the story of Dehydration is available. Send for your copy.

1. INERT ATMOSPHERE
2. UNIFORM PRODUCT
3. NO OXIDATION



The illustrated dehydrator is the Bowen "De-Hy" using inert atmosphere for the drying medium.

Free



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Bowen Research Corporation

BOWEN

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Please send me a copy of "Dehydration" without charge.

Name.....

Company.....

Street.....

City.....State.....

(Continued from page 96)

Product	1943 packing quota	Closure material indicated by X: Tin-plate	Black-plate	Rubber
VEGETABLES AND VEGETABLE PRODUCTS				
1. Asparagus, green	Unlimited	X	..	X
2. Beans, with or without pork	25% 1941*	X	..	..
3. Beans, fresh, including green, wax, lima, green soybeans, and fresh shelled beans	Unlimited	X	..	X
4. Beets, including pickled beets. No whole beets larger than U. S. Standard ruby (medium) to be packed	200% 1942–3	X	..	X
5. Carrots. Whole carrots not to be packed	150% 1942	X	..	X
6. Corn, fresh, sweet, cut	Unlimited	X	..	X
7. Peas, fresh, green	Unlimited	X	..	X
8. Spinach, and other green leafy vegetables limited to beet, collard, dandelion, kale, mustard, polk, and turnip greens	300% 1941	X	..	X
9. Tomatoes	Unlimited	X	..	X
10. Tomato catsup and chili sauce, containing not less than 10.7 percent (specific gravity 1.045) or more than 25 percent, by weight, dry tomato solids:				
Closures without rubber	200% 1942	X	..	..
Closures with rubber	150% of 1942	X	..	X
11. Tomato paste, containing not less than 25 percent, by weight, dry tomato solids	50% 1942*	X	..	X
12. Tomato pulp or puree, containing not less than 10.7 percent (specific gravity 1.045) or more than 25 percent, by weight, dry tomato soilds	100% 1942	X	..	X
13. Tomato sauce, including spaghetti sauce containing not less than 8.7 percent (specific gravity 1.037) by weight, dry tomato solids, and not less than 10.0 percent (specific gravity 1.042) by weight, total dry solids, salt free. In addition to salt, the contents may contain pepper, spice oils, and other flavoring ingredients	100% 1942*	X	..	X
14. Vegetables, dehydrated	Unlimited	..	X	..
15. Vegetable juices, or mixtures thereof, undiluted, except for the addition of sweetening or seasoning	Unlimited	X	..	..
NOTE: When required for packing other products, tomato paste, tomato pulp or puree, tomato sauce, and tomato juice may be repacked from reusable cans, 5 gallon or larger.				
FRUITS				
1. Apples, including crabapples; whole apples not to be packed	10% 1941–2*	X	..	X
2. Applesauce, including sauce from crabapples	10% 1941–2*	X	..	X
3. Apricots. Packing quota includes pack required to be set aside by any order of the Director General for Operations for purchase by government agencies	100% 1942	X	..	X
4. Blackberries, black raspberries, boysenberries, dewberries, elder berries, gooseberries, loganberries, red raspberries, and youngberries	225% 1942	X	..	X
5. Cherries, red sour pitted and sweet	200% 1942	X	..	X
6. Figs. Packing quota includes pack required to be set aside by any order of the Director General for Operations for purchase by government agencies	100% 1942	X	..	X
7. Fruit cocktail, consisting of any combination of fruits listed in this Schedule I and grapes and pineapple: *Provided*, That the combination, by drained weight, shall consist of not less than 50 percent fruits listed in this Schedule I and may consist of not to exceed 10 percent grapes. Pineapple may be repacked from No. 10 or larger cans to the extent of 7 percent of the fruit cocktail	Unlimited	X	..	X
8. Olives, ripe or green ripe, whole or minced	75% 1941–2*	X	..	X
9. Peaches, clingstone, halves, segments, or slices	Unlimited	X	..	X
10. Peaches, freestone, halves, segments, or slices. Not to be packed in California	Unlimited	X	..	X
11. Pears. Whole pears, except seckle pears, not to be packed	Unlimited	X	..	X
12. Plums	150% 1942	X	..	X
13. Prunes, fresh Italian	200% 1942	X	..	X
FRUIT PRODUCTS				
1. Fruits, crushed	100% 1942*	..	X	..
2. Fruit butters, conserves, jams, jellies, marmalades, and preserves	100% 1942	X	..	X
3. Fruit juices or mixtures thereof, other than grapefruit juice, undiluted except for the addition of sweeting	100% 1942*	X	..	X until 3/31/43
4. Grapefruit juice	100% 1942*	X	..	X
5. Fruit concentrates, liquid, when concentrated on a ratio of 5 or more to 1	100% 1942*	X	..	X
6. Fruit concentrates, dry	Unlimited	..	X	..
7. Nectars	100% 1942*	X	..	..
8. Pectin, liquid	100% 1942*	..	X	..
MISCELLANEOUS FOODS				
1. Baby foods:				
Consisting of food products of small particle size or in liquid or semiliquid form made from the folowing ingredients: fruits (except dried apricots, dried pears, dried peaches, dried or dehydrated apples); vegetables; meats; poultry products; dairy products; sugar; salt or seasoning; yeast or yeast derivatives.	125% 1942	X	..	X
Frozen fruits and vegetables may be used, provided that no person shall use more than 35 percent, by weight, of the amount which he used for baby foods in 1942. Potatoes and cereals may be used only in combination with other permitted products, and only provided the combined potato and cereal content does not exceed 12 percent, by weight, of the total product. Pineapple from No. 10 cans and tomato products from 5-gal. reusable cans may be used in packing baby foods.				
Formulas—dry or liquid	125% 1942*	..	X	..
2. Cherries, maraschino	100% 1942	..	X	..
3. Baking powder	100% 1942*	..	X	..
4. Dyes, certified colors	75% 1942	..	X	..
5. Extracts	100% 1942	X	..	..
6. Malt, dry	100% 1942*	..	X	..
7. Milk fortifiers	100% 1942	..	X	..
8. Nut butters	150% 1942	..	X	..
9. Soups, dehydrated	100% 1942	..	X	..
10. Spice	100% 1942	..	X	..
11. Vinegars	100% 1942	X	..	..
12. Special food products, for human consumption only, limited to foods other than usual table foods. Quota: No person shall pack any special food product unless he packed the product in substantially the same form in 1942, and unless he obtains prior permission upon application to the War Production Board.	(1)	(1)	(1)	(1)

[1] See product column. *Relates to number of closures and cans for packing.

Order Restricts Sales Of Packaged Chicory

To ASSURE an adequate supply and efficient distribution of roasted chicory, Food Distribution Order No. 5 restricting the sale and delivery of packaged chicory was issued on January 12 by Food Administrator Wickard. Under the order, the greater part of the chicory production must continue to be sold in bulk for customary coffee blending purposes. This will allow the flow of roasted chicory to consumers to follow the channels customary in previous years.

Specifically, the order provides that in 1943 a processor shall not sell a greater percentage of packaged chicory, in relation to his total sales, than he did in 1941. Also, during any three-month period no processor shall deliver packaged chicory in an amount greater than one-fourth of his 1943 permissible sales of packaged chicory.

Two Food Plants Get Army-Navy "E" Award

Two more food plants have received the Army-Navy "E" award for outstanding performance on war work. The large Chicago packing plant of Swift & Co. and the Peekskill, N. Y., plant of Standard Brands, Inc., were presented with the "E" flag at ceremonies held on January 21.

The first meat packing plant to win this award, the Swift Chicago factory was cited for efficiency in producing and distributing large quantities of meat and meat products where and when wanted by the military and also for close cooperation with the Quartermaster Corps and the meat industry in the development of new food products and new methods. Swift has helped to develop new canned combat rations, a new method of preparing frozen boneless meat cuts, dehydrated food cookery and self-refrigerated shipments of perishable products by means of insulation with frozen lard.

The Standard Brands plant received the award for excellence in production of active dry yeast.

SCHEDULE OF EVENTS

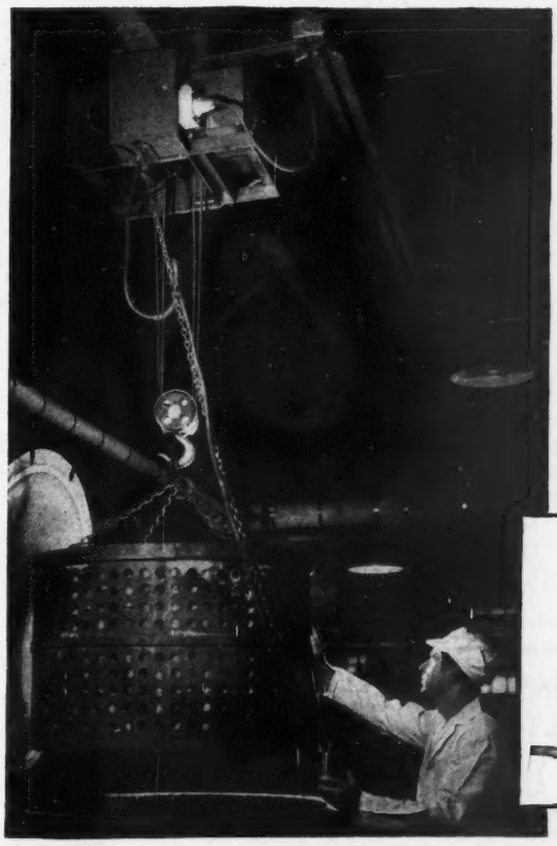
FEBRUARY

1–12—Canners and Frozen Food Packers School, 22nd annual meeting, Oregon State College, Corvallis, Ore.
5—Canning Machinery & Supplies Association, special annual meeting, Hotel Statler, Buffalo, N. Y.
15–22—National Cherry Week.

MARCH

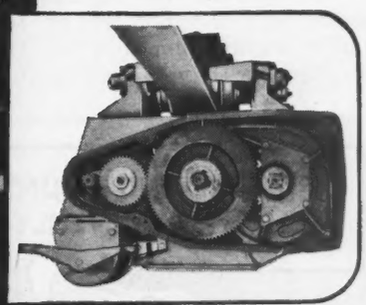
8–11—American Society of Bakery Engineers, annual meeting, Edgewater Beach Hotel, Chicago, Ill.

Save MANPOWER and CUT COSTS with R&M ELECTRIC HOISTS!



◀ This R & M Hoist is one of several installed in a large Chicago plant.

This view shows the extreme accessibility of the R & M hoisting mechanism, which may be easily withdrawn when cover is removed. Note also the compact design that provides low headroom and maximum lift.



Are you looking for a practical, experience-proved method of saving manpower and lowering your handling costs? Then why not follow the example of leading food producers by installing R & M Electric Hoists wherever there's heavy lifting or conveying to be done?

These hoists are built for *hard work*—around the clock and around the calendar. They're fast, efficient, and require little maintenance because they're precision-built from track to hook, because they're powered by famous R & M motors, because they're perfectly balanced, and because they're equipped with an oversize oil-cooled automatic load brake.

Whether you require capacities of 1000 or 15,000 lbs., there's an R & M Hoist *tailor-made* for the job—and it can be equipped with special trolleys to fit any type of monorail.

Your nearest R & M sales and service office will be glad to furnish complete details. Or, if you prefer, write us at the factory.

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Atlanta.....319 Walton Bldg.
Baltimore, Lombard & Concord St.
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Chicago...2400 W. Madison St.
Cincinnati.....418 New St.
Cleveland. 470 Rockefeller Bldg.
Denver.....1420 16th St.
Detroit....2921 E. Grand Blvd.
Houston..3715 Harrisburg Blvd.
Jacksonville...305 Bisbee Bldg.
Meriden, Conn..135 Colony St.
Newark.....700 Bergen St.
New York.....200 Varick St.
Philadelphia....401 N. Broad St.
Pittsburgh....H. W. Oliver Bldg.
Providence.....44 Clifford St.
San Francisco, 116 New Mtgmry St.
Seattle.....216 Walker Bldg.
Syracuse...204 State Tower Bldg.
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Congress Gets Food Budget

$988,917,431 is total estimated for year. Wickard may ask change in appropriations

THE budget as it was presented to Congress means little to the food industries since the figures were compiled prior to the time that the Department of Agriculture was reorganized by the Executive Order of December 5 making the Secretary of Agriculture the Food Administrator. But the figures submitted by the President are interesting. The total estimate for the Department of Agriculture amounts to $988,917,431, up $172,000,000 from the last fiscal year. The largest single item is 400 million dollars for the conservation and use of agricultural land resources. Parity payments recommended for 1944 amount to $193,600,000. The total estimated requirements for the Agricultural Conservation and Adjustment Administration was stated as $688,560,420, roughly two-thirds of the 1944 total for the Department.

The total for the Agricultural Research Administration was up $6,000,000 to slightly more than $40,000,000. Experiment stations were unchanged. For the Bureau of Animal Husbandry, the eradication of tuberculosis and Bangs disease was estimated to require $2,400,000 more than last year. The figure for meat inspection was up slightly. The Bureau of Dairy Industry was about the same while the Bureau of Plant Industry was down slightly.

The Bureau of Agricultural Chemistry and Engineering estimate was down slightly while the regional research laboratories remained close to $4,000,000.

The figure for the administration of the Sugar Act was up approximately 33 percent to nearly $64,000,000. The estimated total for the Agricultural Marketing Administration was down to $102,000,000, which is a sharp decrease from the expenditure of two years ago of more than $150 million.

Farther over in the book is the figure for the enforcement of antitrust and kindred laws, which was down from $1,800,000 to $1,600,000.

Meat Supplies Up

Supplies of meat in 1943 are expected to reach 25,800,000,000 lb., according to the Department of Agriculture. This amount is expected to be made up of 13,800,000,000 lb. of pork, 28 percent more than in 1942; 10,900,000,000 lb. of beef and veal, 7 percent more than in 1942; and 1,100,000,000 lb. of lamb and mutton, slightly below 1942 output. The total will be about 4,000,000,000 lb. over the 1942 production.

In spite of this increase, however, less meat is expected to be available for civilians throughout the year, as more will be needed for both the armed forces and for Lease-Lend. Between 17,000,000,000 and 18,000,000,000 lb. is expected to be available for civilian consumption, and the Food Administration expects civilians to fill out their needs from the increase of about 1,000,000,000 lb. expected in the production of poultry meat. However, in view of the definite and increasing shortage of seafood, the increase in poultry will not be enough to bring the animal food supply for civilians up to normal. Drastic and strict rationing of all animal protein foods is certainly likely before long.

CONSTRUCTION NEWS

	Pending (thousands)	Awarded January (thousands)	Total Awarded 1942 (thousands)
Bakery	.....	.....	$115
Beverages	.....	.....	1,227
Canning and Preserving	$50	.....	545
Cold Storage Plants	40	.....	665
Confectionery	.....	.....	.....
Grain Mill Products	40	.....	735
Ice Manufactured	40	.....	180
Meats and Meat-Products	40	.....	263
Milk Products	80	$80	1,892
Miscellaneous	465	230	4,507
	$755	$310	*$10,129

* Complete 1942 total

More Dried Eggs

In spite of increases in capacity of egg drying plants during 1942, bringing 1943 potential output to more than 400,000,000 lb., steps are being taken to bring about a further increase. Meetings held between the Department of Agriculture and prospective egg dryers will arrange for facilities to increase output. Such increase will be provided only in localities where raw materials will be available. This was allowed for when the 1943 farm production goals were set.

Commodity Indexes Go Still Higher

Regardless of price ceilings on most commodities, indexes of commodity prices have risen over the year end. In the five-week period from December 12, 1942, to January 16, 1943, the *N. Y. Journal of Commerce* weekly general commodity index rose

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When mounting a Viking Rotary Pump and bolting it down, be sure that the base is not sprung. Bolting the pump down over an uneven surface may cause binding and heating in the stuffing box. It may cause working parts of the pump to bind and wear beyond repair in a short time. The pump must be free enough to turn the shaft by hand.

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from 105.0 to 106.9. In the same period, the same publication's grain price index increased from 99.8 to 106.7 and its food price index jumped from 107.2 to 111.4.

Among the spot prices of individual commodities, increases were largely confined to the grains and grain products, as most others were under ceilings. Wheat, No. 2 hard winter, Kansas City, at $1.28 on December 12, rose to $1.35¾ by January 16. Corn, No. 3 yellow, Chicago, moved up from 91c. to 96c. in the same period. And flour, in the same five weeks, advanced from $6.45 to $7.05.

INDICATORS

Flour production in December, 1942, by mills accounting for 65 percent of United States output, according to *The Northwestern Miller*, was 6,877,257 bbl., compared to 5,961,077 bbl. in December of the preceding year.

Confectionery and competitive chocolate product sales in November, 1942, totaled $37,488,000 for the 213 forms reporting, according to the Department of Commerce. This represents an increase of 6 percent over sales in November, 1941.

Corn pack in 1942 was the largest on record, according to the National Canners Association, totaling 33,147,054 actual cases compared to 27,047,845 cases a year earlier.

Fishery products held in cold and frozen storage on December 15, 1942, totaled 105,698,788 lb., compared to 117,805,373 lb. on the corresponding date a year earlier.

Milk, fluid, daily average sales in November, 1942, were reported by the Milk Industry Foundation as 19 percent over sales during November, 1941.

Butter, creamery, produced in November, 1942, was reported by the U. S. D. A. at 107,480,000 lb., a decrease of 4.4 percent from November, 1941, output and 3.4 percent below the average 1931-1940 figures for November.

Butter, creamery, produced in the first eleven months of 1942, totaled 1,662,730,000 lb., 5.1 percent below the 1941 total for the period, but 4.2 percent above the 1931-1940 average output.

Cheese, American, produced in November, 1942, according to the U. S. D. A., was 43,170,000 lb., a decrease of 23.4 percent below last years output for the same month, but 52.8 percent above the 1931-1940 November average.

Cheese, American, produced in the first eleven months of 1942 totaled 875,270,000 lb., 26.2 percent over the output for the same months of 1941, and 95.7 percent over the 1931-1940 average for the period.

Skim milk, dried, produced in November, 1942, totaled 29,000,000 lb., according to the U. S. D. A. This was 10 percent above the output in November, 1941, and 20 percent greater than the 1936-1940 November average.

Skim milk, dried, produced in the first eleven months of 1942 totaled 580,000,000 lb., up 30 percent over the corresponding period of a year earlier.

Milk, whole, dried, in November, 1942, totaled 4,300,000 lb., compared to 3,480,000 lb. in November 1941. For the first eleven months of 1942, the output was 55,410,000 lb., an increase of 29 percent above the corresponding 1941 period.

Evaporated milk produced in November, 1942, totaled 163,648,000 lb., 37 percent below output in November, 1941, but 41 percent above the 1936-1940 average for the month.

Oleomargarine sales in November, 1942, as indicated by sales of internal revenue stamps, totaled 42,951,072 lb., 23 percent over sales in November, 1941. For the first eleven months of 1942, oleomargarine sales totaled 320,377,794 lb., a decrease of 4.7 percent below sales in the corresponding 1941 period.

Milk production on farms in the United States in 1942 was 119,412,000,000 lb., a record output, but lower than total requirements as outlined by the U. S. D. A. in January, 1942.

Chick output by commercial hatcheries in November, 1942, at 24,913,000 was 10 percent above November, 1941, the previous record.

Eggs, dried, produced in November, 1942, totaled 18,808,000 lb. of dried product, compared to 7,457,000 lb. in November, 1941.

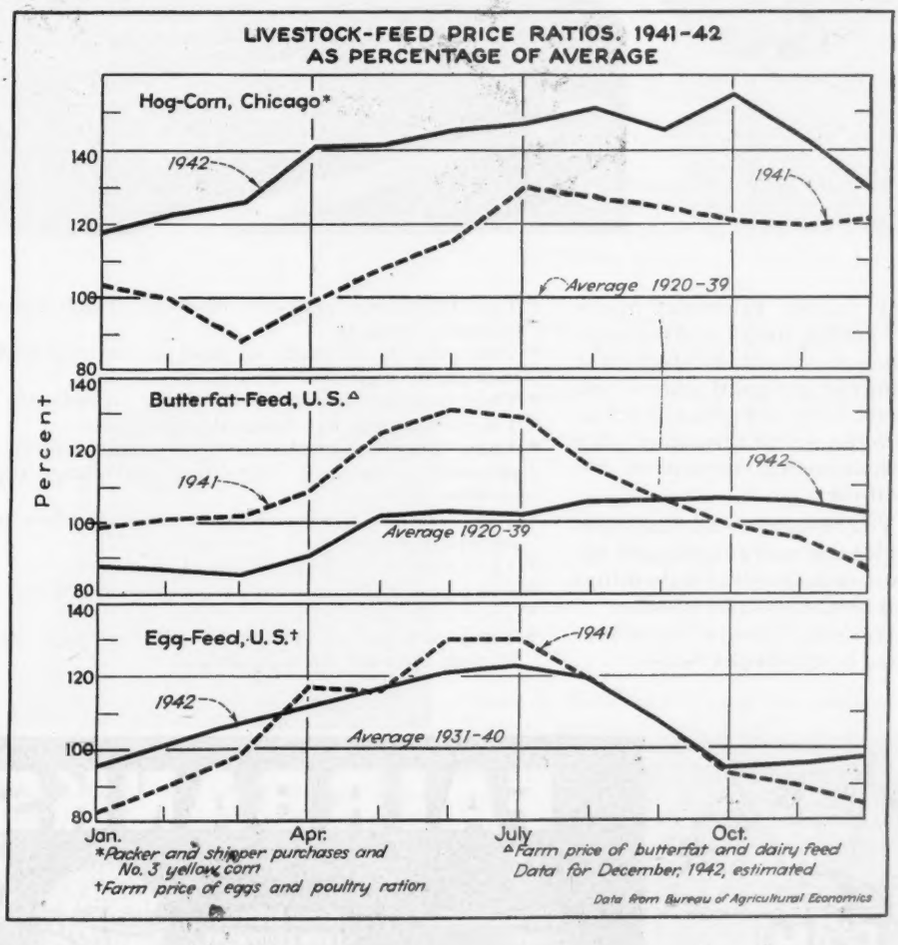
Egg production in 1942 is reported by the U. S. D. A. at 47,959,000,000, a record figure and 15 percent over the former record made a year earlier.

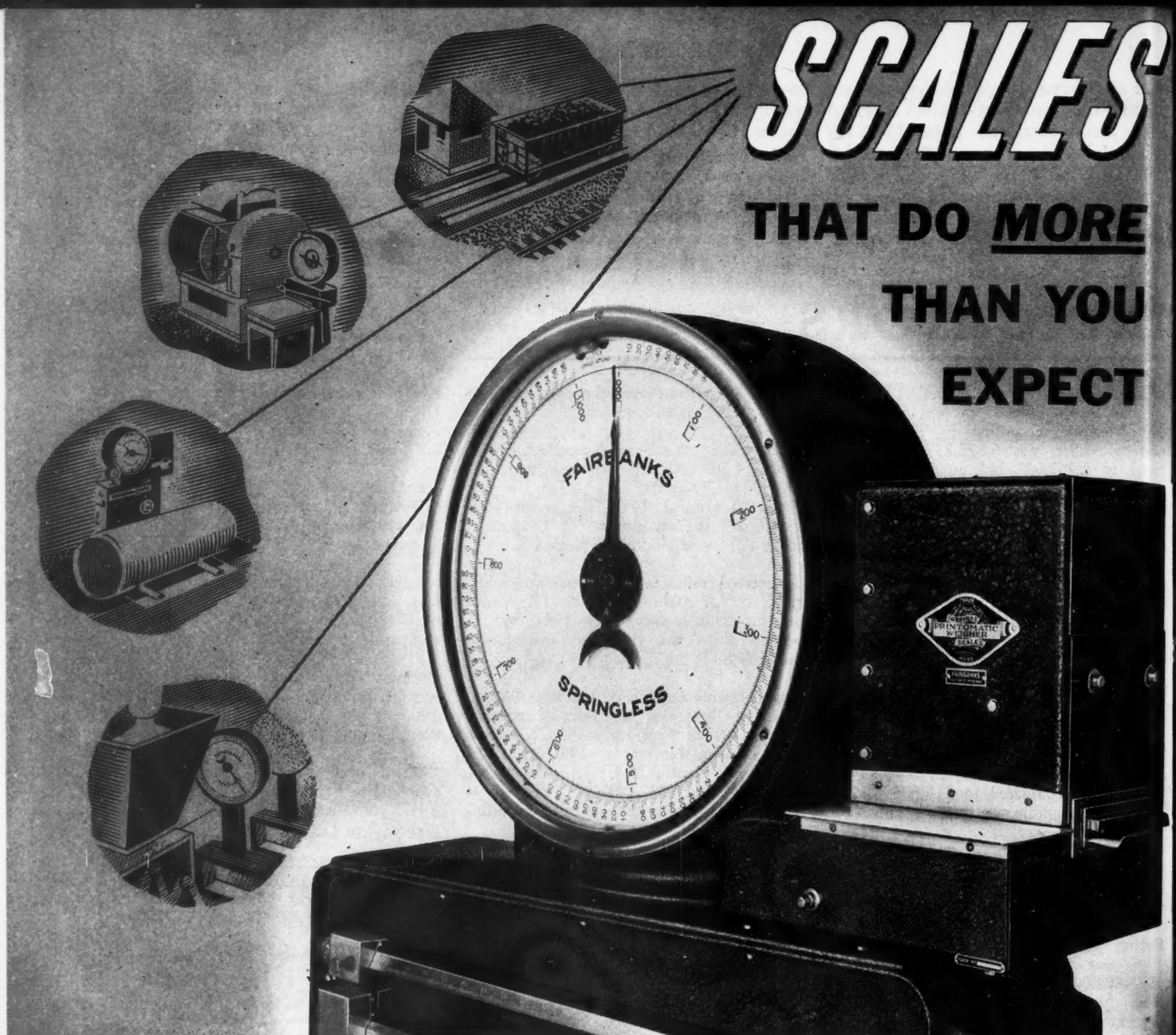
Vegetable production on 1942 is reported as totaling 10 percent above 1941 output. Production of vegetables for processing was 13 percent over the 1941 figure.

Weekly wholesale food price index of Dun and Bradstreet stood at $4.02 at the close of 1942, the highest figure in 22 years and comparing to $3.43 a year earlier.

Business activity index of **Business Week** was 191.0 on January 9, 1943, compared to 190.5 a month earlier and 163.6 on the corresponding 1942 date.

Cost of living index of National Industrial Conference Board was 101.0 in December, 1942, compared to 100.3 a month earlier and 93.2 in December.





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The feature about Fairbanks Scales that may surprise you the most, is their ability to do things you *don't* expect of scales.

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- They count small parts — more accurately than manual counting
- They weigh carloads of coal in motion and make a printed record of each weight
- They control automatically paint ingredients
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- They "keep the books" in steel plants, making printed records of incoming and outgoing shipments
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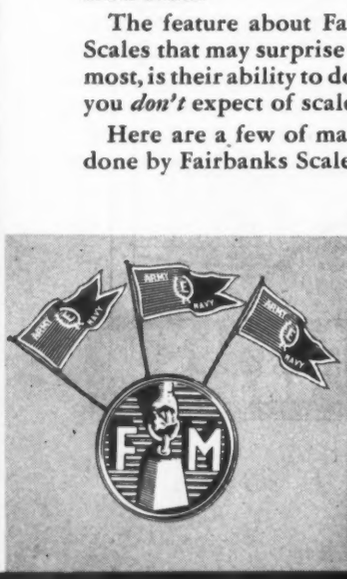
- They record the *flow* of liquid chemicals
- They guard secret formulas in compounding
- They control batching in bakeries
- They prevent disputes by eliminating the human element in weighing.

AND all of these things, only the beginning of the story, they do automatically and mechanically thereby eliminating human errors.

How Fairbanks Scales can be fitted into your production flow to speed up operations and eliminate errors may prove to be the most interesting discovery you ever made. Investigate now. Write Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago, Illinois.



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Scales

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INDUSTRY

Birds Eye Frosted Foods Corp. has established a new branch office and warehouse at Providence, R. I., managed by John W. Wraga.

Blackfoot (Idaho) Dried Foods Co. recently had its entire new dehydrating plant destroyed by fire, just before production was to begin on julienne potatoes for government use.

British Columbia Packers, Ltd., Vancouver, B. C., will spend $36,000 in constructing new buildings and installing equipment at Wadhams, Rivers Inlet, B. C.

Cincinnati Vitamin Co. has issued a booklet, "Vitamins are War Workers," showing the role of vitamin diets in industrial production.

Cranberry Canners, Inc.'s new cannery at Markham, Wash., and a 10,000-gal. cranberry pack for the Army, were recently destroyed by fire of undetermined origin.

Dixie Frosted Foods, Birmingham, Ala., has begun erection of a frozen food plant at Georgiana, Ala., to have a capacity of 25 tons of frozen food per day.

Friend Bros., Inc., Melrose, Mass., is introducing a new product, frosted baked beans, in a New England test market.

H. J. Heinz Co.'s tomato products plant at Fremont, Ohio, is installing equipment to dehydrate foods for army and Lend-Lease use.

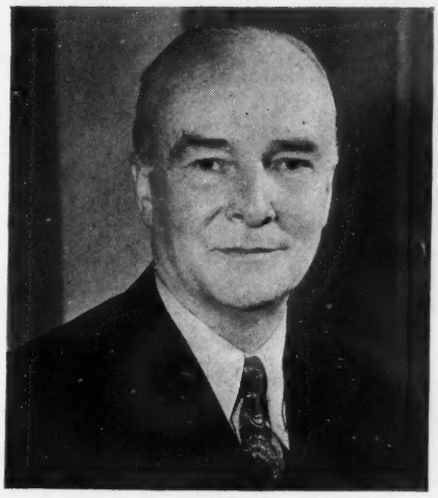
International Milling Co. has purchased Commercial Milling Co., Detroit, and will continue the business with practically no change in personnel or brands.

Laurel (Miss.) Starch Co.'s plant has been approved as a government dehydration unit, and authorized to process vegetables for Army, Navy and Lend-Lease.

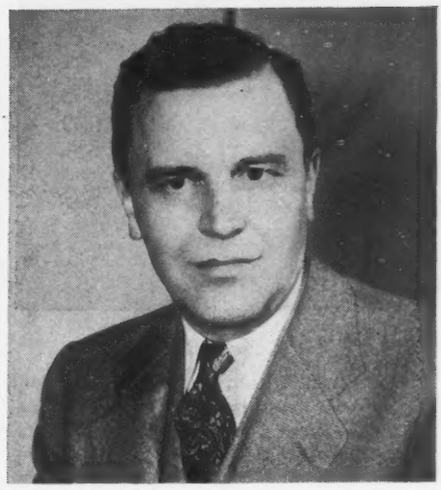
McDonald Dairy Co., Flint, Mich., has been reorganized as McDonald Cooperative Dairy Co., a nonprofit organization. Ownership of the firm will gradually pass into the hands of the company's farmer patrons.

Mitchell Dairy and Borden's Farm Products, division of the Borden Co., are introducing a new product, "D-Q," (daily quota) vitamin-fortified fresh milk, in a Connecticut area.

Pasco Packing Association, Date City, Fla., Plymouth (Fla.) Citrus Growers Association and Engelman Products Co., Elsa, Tex., will operate under U. S. continuous inspection, bringing the number of plants to 59 now operating under the Department of Agriculture's inspection program.



DR. THEODORE SEDLMAYR



CHESTER A. BARTH

Standard Brands, Inc., has appointed Dr. Theodore Sedlmayr as a director and vice-president in charge of manufacture, purchasing and traffic. Chester A. Barth has been named vice-president and general sales manager, and Philip S. Lord is new field sales manager of the company.

Sprague-Warner-Kenny Corp., Baltimore, Md., has purchased Staples Grocery Co., Richmond, Va. Milton B. Staples continues as manager of the latter firm.

Warner Sugar Corp. has been reorganized, and all fixed assets of the company acquired by Miranda Sugar Estates, a Cuban corporation and subsidiary of Warner.

RICHARD C. STAELIN

R. C. Staelin has joined Grocery Store Products Co. as assistant to the president, taking over administrative duties in all phases of the company's operations. Mr. Staelin was formerly with Grocery Manufacturers of America, Inc.

PERSONNEL

Austin E. Anson has been appointed executive manager of Texas Citrus and Vegetable Growers and Shippers, San Antonio, Tex.

Roy G. Clark succeeds the late Albert H. Morrill as president of the Piggly Wiggly Corp., Atlanta, Ga.

Louis J. Dudt, president of Pennsylvania Baker's Association, has been elected to succeed Robert J. Shearer on the board of Associated Retail Bakers of America, Chicago, Ill.

Thomas G. Fletcher, credit manager of the sales company division of Borden Co., New York, has retired after a business career of 54 years. He is succeeded by Clarence E. Cranch.

E. F. Frasier has been named manager of the San Francisco branch of H. J. Heinz Co. He has been with the firm 15 years.

F. C. Frey, American Maize Products Co., has been appointed sales manager of bulk products, and A. P. Hellwig has been made sales manager of specialty products of the firm.

Jack E. Gleason has succeeded Gordon Flanders as manager of Armour & Co.'s plant at Little Rock, Ark. Mr. Flanders has entered the Army after three years as manager.

Dr. H. C. Gore of the research department of Standard Brands, Inc., has temporarily retired from active business and is spending the winter in Florida.

H. B. VIEDT

H. B. Viedt has been named vice-president in charge of production of The Best Foods, Inc. J. E. Mount is secretary; W. S. Morgan was named treasurer; G. C. Spitzmiller became vice-president in charge of sales, and H. W. Vahlteich is vice-president in charge of research and quality control.

RAYMOND K. STRITZINGER

Continental Baking Co. has elected Raymond K. Stritzinger president to succeed M. Lee Marshall, who remains chairman of the board. Mr. Stritzinger has been an executive of the company since 1925, when Continental purchased the Stritzinger business.

L. K. Harper, Sardik Food Products Corp., New York, has been reelected president of National Dehydrators Association. Vice-president is Joseph B. Pardieck, California Vegetable Concentrates, Inc.

Horace Havemeyer, Jr. has recently been appointed executive vice-president of National Sugar Refining Co., New York.

Arthur P. Herold, formerly vice-president, succeeds Arthur M. Ghormley as president of Albers Milling Co., Seattle, Wash. Mr. Ghormley, who continues on the board, is vice-president of Carnation Co.

Harold K. Kramer, assistant treasurer of Borden Co., New York, has recently been elected assistant vice-president, and will continue for the time being as assistant treasurer of certain subsidiary companies and operating divisions.

Carroll E. Lindsey, Lake Highlands Canning Co., Highland City, Fla., has been elected 1943 president of National Canners Association. Vice-presidents are G. Sherwin Haxton, Haxton Canning Co., and Alfred W. Eames, California Packing Corp.

Asher J. Margolis, formerly chief chemist of Nutrine Candy Co., Chicago, has joined the chemical staff of the Emulsol Corp., Chicago.

W. C. Mitchell, former Chicago sales manager for Libby, McNeill & Libby, has been named assistant to the president of the company.

L. N. Perrin, General Mills, Inc., New York has been elected executive vice-president.

Paul T. Truitt recently has been named president of National Association of Margarine Manufacturers, with offices in Washington, D. C.

L. H. Weiner, president of Borden-Wieland Co., is 1943 president of the Chicago Dairy Technology Society. Vice-president is J. E. Rockwell, of Hawthorne Mellody Farms.

DEATHS

Howard W. Beach, 60, one-time president of the Oyster Growers and Dealers Association of America, Dec. 30, in Jacksonville, Fla.

William W. Brown, 51, an outstanding figure in the baking industry, and manager of the Kansas City region of Standard Brands, Inc., recently, in Kansas City.

George Washington Carver, 78, noted Negro scientist in the field of agricultural research, Jan. 5, in Tuskegee, Ala.

William T. Clark, 78, former owner of Nippersink Dairy, Fox Lake, Ill., and a pioneer in the development of milk handling methods, Jan. 4, in Chicago, Ill.

Charles R. Dutcher, 54, former president of Rutherford Food Products, South Miami, Fla., Dec. 22, in Miami, Fla.

Joseph V. Kovar, 68, founder and retired director of Pilsen Brewing Co., recently, in Chicago.

Howard R. Lyon, manager of the Raleigh, N. C., branch of National Biscuit Co., Dec. 21, in Raleigh.

Norris H. Mundy, 68, retired partner of W. A. Havemeyer & Co., sugar refining agents, Jan. 5, in Bayside, N. Y.

E. Douglas Roszell, 62, vice-president and treasurer of J. D. Roszell Dairy Co., Peoria, Ill., recently, in Peoria.

Philip H. Schmidt, 50, a partner in Schmidt Brothers Meat Packing Co., Long Branch, N. J., Dec. 29, in Long Branch.

Harry Stiner, formerly in charge of pest control, National Biscuit Co., New York, recently, in Glendale, Calif. Mr. Steiner was the author of many articles in Food Industries on the subject of control of pests around food plants, and was an authority on the fumigation of foods.

Homer F. Ziegler, 59, vice-president of Anheuser-Busch, Inc., St. Louis, Mo., Dec. 30, in St. Louis.

ASSOCIATED INDUSTRIES

The Army-Navy "E" award recently has been presented to Monsanto Chemical Co., Fulton Sylphon Co. and Buffalo Forge Co. Crane Co. was given the award for outstanding production of its regular products, and the Double "E" was also awarded to Dow Chemical Co.

E. I. du Pont de Nemours & Co., Wilmington, Del., was presented a special award of honor "for distinguished service to safety," by National Safety Council.

Food Machinery Corp. has named James M. Hait, formerly chief engineer, as general manager of its Peerless Pump division.

General Electric Co. recently completed the construction of a "blackout" windowless factory, somewhere in New England, for the manufacture of turbosuperchargers for military airplanes.

Mono Service Co., Newark, N. J., has published a booklet, "Why Feed Your Employees," showing the progress made in a lunch program in the plant of Edward G. Budd Manufacturing Co., Philadelphia, Pa.

Reynolds Metals Co., Richmond, Va., has begun production on a dehydrated food container for shipping food, medical and ordnance supplies. This container means a saving of vital war materials.

Joseph T. Ryerson & Son, Inc., has published a booklet commemorating its 100th anniversary entitled, "100 Years of Peace and War." The booklet reviews the nation's industrial growth during the past century.

Douglas T. Sterling Co., Stamford, Conn., has appointed Albert C. Delmont as research director of the newly organized research and laboratory departments.

Traver Corp., Chicago, Ill., has announced that Major Robert N. McCreary, vice-president, is now serving as an officer in the Adjutant General's Department.

Union Bag & Paper Corp., N. Y., has elected Donald J. Hardenbrook, assistant to the president. He was recently appointed postwar planning manager of the firm.

WILL AMERICANS OF THE FUTURE ENJOY A STEAK DINNER OUT OF A *Capsule?*

The war is revolutionizing our eating habits and our thinking in terms of food. Millions of soldiers are learning for the first time of the importance of vitamins in nutrition. And in their emergency field rations, they are encountering at first hand the amazing developments of concentrated and synthetic foods. Civilians, too, are being taught to recognize the part vitamins play in foods.

★ What effect will all this have on the food industry tomorrow? How will it affect your business, your food products, your planning for future markets?

★ Let our Foodstuffs Planning Board sit down with you and map out a plan of action for meeting new demands . . . a plan custom-tailored to your own individual requirements. Write for further information.

* American Council of Commercial Laboratories

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VITAMIN *Testing*

We make determinations for Provitamin A, Vitamins B_1, B_2, B_6, Niacin, and C, Vitamin D, and Pantothenic Acid. We have also developed special tests for dehydrated, concentrated, canned, and compressed foods before and after processing to determine vitamin loss. What's your problem? . . . we have a test to solve it. Write.

UNITED STATES TESTING COMPANY, INC.

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PATTERSON-KELLEY SPECIALIZES IN

Sanitary Engineering

FOR THE FOOD INDUSTRY

Patterson-Kelley Steam Jacketed Mixer. Constructed of non-ferrous metal, with steel jackets, for a steam working pressure of 125# and a 30" shell vacuum.

Mixing mechanism and top head completely removable as a single unit. Permits thorough cleaning. Anchor type agitator.

Sanitation is as important in the design of food equipment as efficient performance. This sturdy Patterson-Kelley mixer gives you the benefit of both. The head and anchor type agitator can be removed from the shell as a single unit. A simple operation that permits thorough cleaning in the shortest possible time.

Made of the finest materials, the mixer combines precision engineering with durable construction. It is typical of the excellent workmanship of Patterson-Kelley kettles, cookers, dryers, dehydrators and heat exchange units. These units may be fabricated from a wide range of metals to meet the most exacting requirements of the food industry.

Patterson-Kelley will be glad to consult with you on your equipment problems—at no obligation to you. Write today for your free copy of the Patterson-Kelley Chemical and Process Equipment Catalog.

EST. 1880

PATTERSON-KELLEY *FOR DEPENDABLE, ECONOMICAL SERVICE*

PATTERSON-KELLEY HEAT EXCHANGE ENGINEERS

THE *Patterson-Kelley* CO., INC.

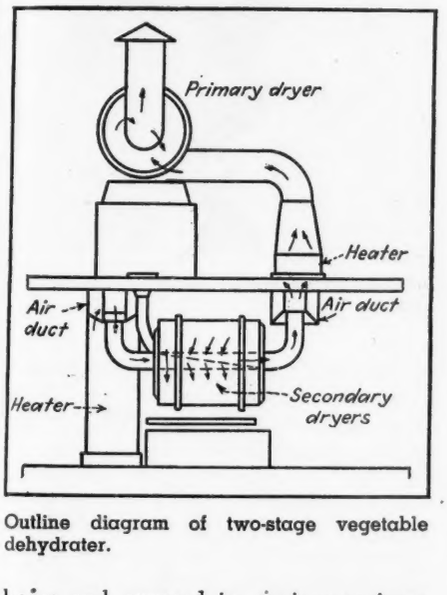
114 WARREN ST., EAST STROUDSBURG, PA.

MANUFACTURERS FOR THE FOOD AND PROCESS INDUSTRIES

FOOD EQUIPMENT NEWS

Two-Stage Dehydrater

A TWO-STAGE continuous dehydrater for vegetables has been brought out by Hersey Manufacturing Co., E and Second Sts., South Boston, Mass. In this dehydrater, the product passes continuously from a final wash after blanching through a primary dryer where, during a period of 45 minutes, it is subjected to a gas temperature of 210 deg. F. From this primary dryer the product passes to one of a battery of five secondary dryers where it is held for three hours and exposed to air temperatures starting at 195 deg. F., and finishing at 165 deg. F.



Outline diagram of two-stage vegetable dehydrater.

The primary dryer is a rotating cylinder mounted at sufficient angle from the horizontal to allow the product to pass through as the cylinder rotates. The secondary dryers are horizontal cylinders, sealed at the end and designed to retain the product during the whole drying time.

In operation, the product is fed from the primary dryer to one secondary dryer for 45 minutes, and the feed is then shifted to the next secondary unit. In this way, four of these secondary units are always at work while one is being unloaded and reloaded.

Heating is accomplished by steam at a pressure of 15 lb. or over, passed through heating coils. Air is drawn through these coils and passes first through the secondary dryer. The air stream next passes through a second heater which raises its temperature to the point used in the first stage, and it then passes into the primary dryer. The manufacturers state that by using the air in this way economy of heat is effected, and, also, the air going to the first stage dryer is comparatively humid, an advantage in preventing case hardening.

A feature claimed for these dehydraters is the method of circulating the air, called the "cross current" method of drying. In this, the heated air is introduced into each dryer through a tube located centrally. This tube has perforations on opposite sides, and a partition divides the tube so that one set of holes supplies a blast of hot air into the product while the opposite set exhausts the air from the dryer.

These dryers are entirely constructed of wood, not only to avoid the use of scarce metals, but also to offset any tendency for the product to stick to the surfaces. The primary dryer is provided with lifting shelves or buckets attached to its inner surface which, when the product is rotated in the dryer, serve to lift it and shower it repeatedly across the current of heated air. Full automatic control of temperature and cycle are supplied with the dryer, and automatic control of product flow can also be furnished, if desired. Mechanical means are provided for unloading the secondary dryers, which are really a series of batch dryers, also for loading each in turn. Where it is possible to locate the primary dryer above the secondary dryers, the transfer from primary to secondary can be gravity. However, where necessary, the entire system can be located on one floor.

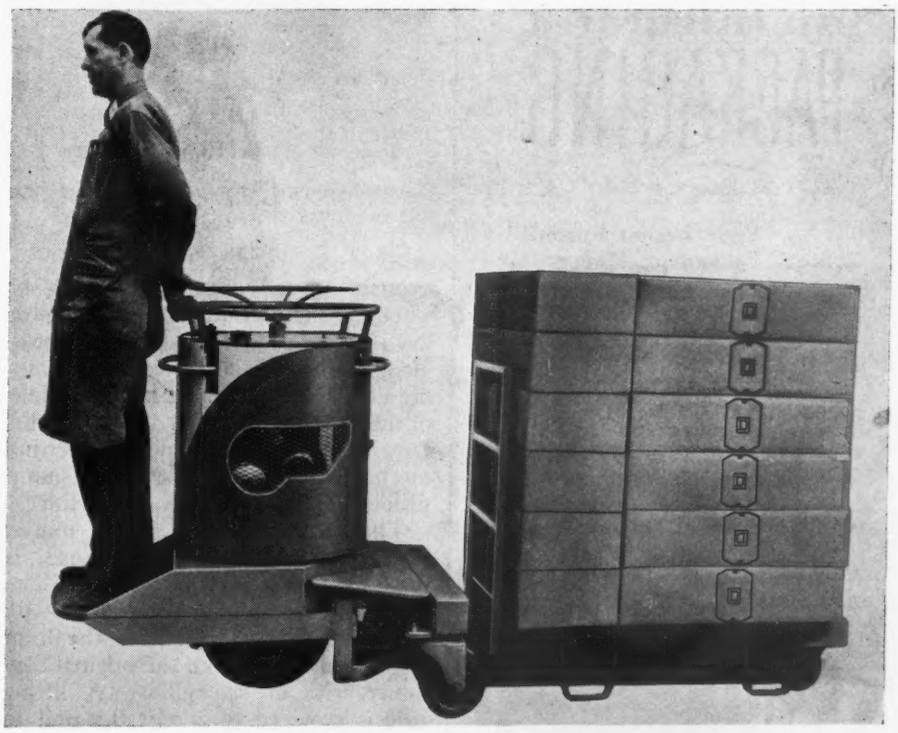
The manufacturer states that these dehydraters are particularly suited for white or sweet potatoes, carrots, beets and turnips. In operation on sliced white potatoes the time of dehydration is 3¾ hours. Units are available in two sizes only, the standard size having a capacity of 500 lb. of dry sliced white potatoes per hour, while a smaller plant is available with a capacity of 100 lb.

Industrial "Turret" Truck

NUTTING TRUCK and CASTER CO., Faribault, Minn., is distributing the Salsbury "turret" industrial truck, available in lift, cargo and tractor types. These trucks are equipped with fully automatic clutch and self-shifting transmission, and are distinguished by the engine-over-drive-wheel power assembly contained within a turret.

Steering is done with the driving wheel, which is said to provide easy maneuverability.

The main frame of the power plant is mounted rotatively in ball bearings, permitting steering in any direction over a 360-deg. arc. To reverse the direction of travel, the operator simply reverses the turret and drive wheel in one and the same motion. This power turret is a complete unit and easily removable from the truck for servicing.



"Turret" type of industrial power truck.

an integrated
PACKAGING
service

Your nearest Rossotti Packaging Man will consider it a privilege to demonstrate how the Rossotti organization can equip your products—or group of products — with it's most salable dress. Or write us at North Bergen direct for constructive, hard-hitting packaging counsel. No obligation, of course.

Rossotti
LITHOGRAPHING COMPANY, INC.
NORTH BERGEN, N. J.
SALES OFFICES IN PRINCIPAL CITIES

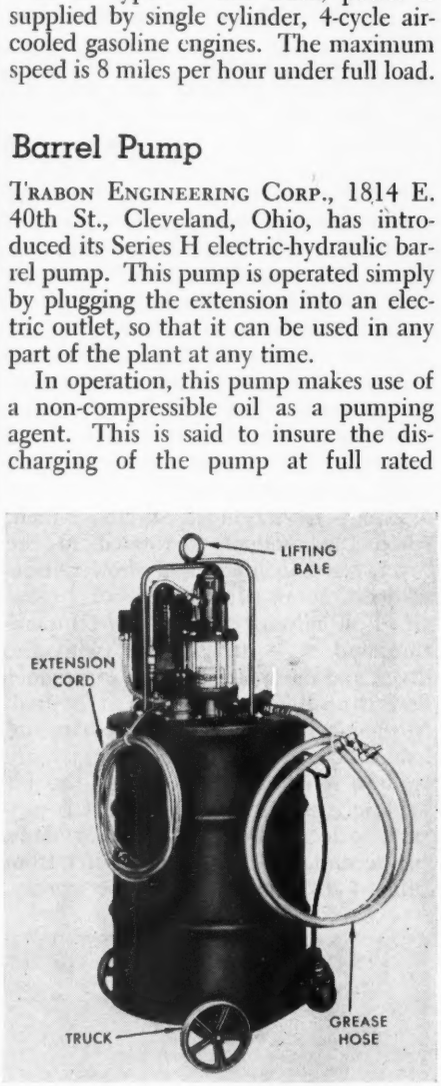
Another feature claimed for this new type of truck is an articulated design, the purpose of which is to ride the load easily over sharp dips, ramps, or uneven travel surfaces, keeping the load practically level and avoiding danger of spilling.

In all types of this truck, power is supplied by single cylinder, 4-cycle air-cooled gasoline engines. The maximum speed is 8 miles per hour under full load.

Barrel Pump

TRABON ENGINEERING CORP., 1814 E. 40th St., Cleveland, Ohio, has introduced its Series H electric-hydraulic barrel pump. This pump is operated simply by plugging the extension into an electric outlet, so that it can be used in any part of the plant at any time.

In operation, this pump makes use of a non-compressible oil as a pumping agent. This is said to insure the discharging of the pump at full rated capacity at all times, regardless of whether the pressure head is high or low. Operation is from a ½ hp. motor, direct connected to the hydraulic pumping unit which is located in the bottom of the hydraulic reservoir. Oil from this reservoir is pumped into a reversing mechanism which operates the pump piston. This piston is double acting.

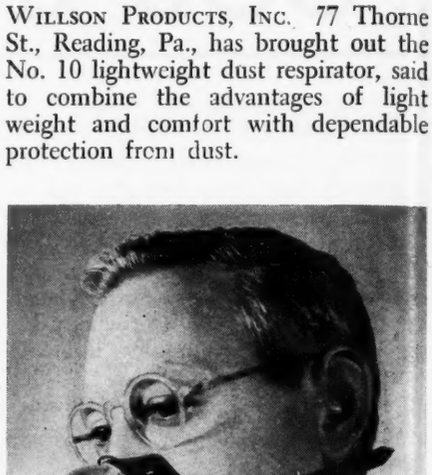


Electric-hydraulic pump for pumping barrels or drums.

The pump, complete with motor, hydraulic cylinder and other parts, is mounted rigidly on a flange head. The flange fits over a standard 5-gal. 400-lb. drum, permitting the liquid in the drum to be pumped up from the original container without rehandling. A lifting bale is provided to permit the unit to be transferred from one drum to another with a hand hoist or lifting bar.

Respirator

WILLSON PRODUCTS, INC. 77 Thorne St., Reading, Pa., has brought out the No. 10 lightweight dust respirator, said to combine the advantages of light weight and comfort with dependable protection from dust.



Lightweight respirator for protection against dust.

The maker states that this respirator is practical for use for long periods of time without impairing workers' efficiency. Breathing freedom is provided through specially designed inhalation and exhalation valves. The face piece is easily adjustable to fit the contour of the wearer's face, and the elastic headbands are designed to hold the respirator comfortably in place.

Vitamin A Meter

PHOTOVOLT CORP., 95 Madison Ave., New York, has brought out the Lumetron vitamin A meter, a photoelectric instrument for the rapid determination of the vitamin A potency of foods and other substances. The operation depends upon absorption at a wavelength of approximately 328 millimicrons. Radiation of a mercury vapor light source passes through a filter combination, consisting of a glass filter and a liquid filter, which transmits only the characteristic absorption band of vitamin A. The ultraviolet light beam then passes through the sample under test and strikes a barrier-layer photocell. The current output of this photocell serves as a measure of the absorption of the sample and therefore as a measure of its vitamin A potency.

The instrument comprises the instrument proper, an auxiliary transformer for the mercury vapor lamp, and a galvanometer. In operation, one of the absorption cells is filled with isopropyl

alcohol, the slidewire dial is set to the zero density point, and the circuit is balanced by means of the balance cell control. Then the other absorption cell containing the sample is inserted, the circuit is rebalanced with the slide wire and the reading is obtained as the slide wire dial setting. The mercury lamp does not require more than five minutes to reach stable operating condition. After that, making a reading takes about 30 seconds.

The instrument is calibrated by means of U.S.P. reference cod liver oil, diluted in isopropyl alcohol. For portability, the instrument can be furnished with carrying cases.

Material Conserving Tanks

In order to supply needed equipment for the food industries during the present emergency, H. K. Porter Company, Inc., 4941 Harrison St., Pittsburgh, Pa., has added to its line of equipment agitated wood tanks made from cypress, redwood, long leaf yellow pine, fir, oak, and poplar. These tanks are equipped with agitators having wood blades.

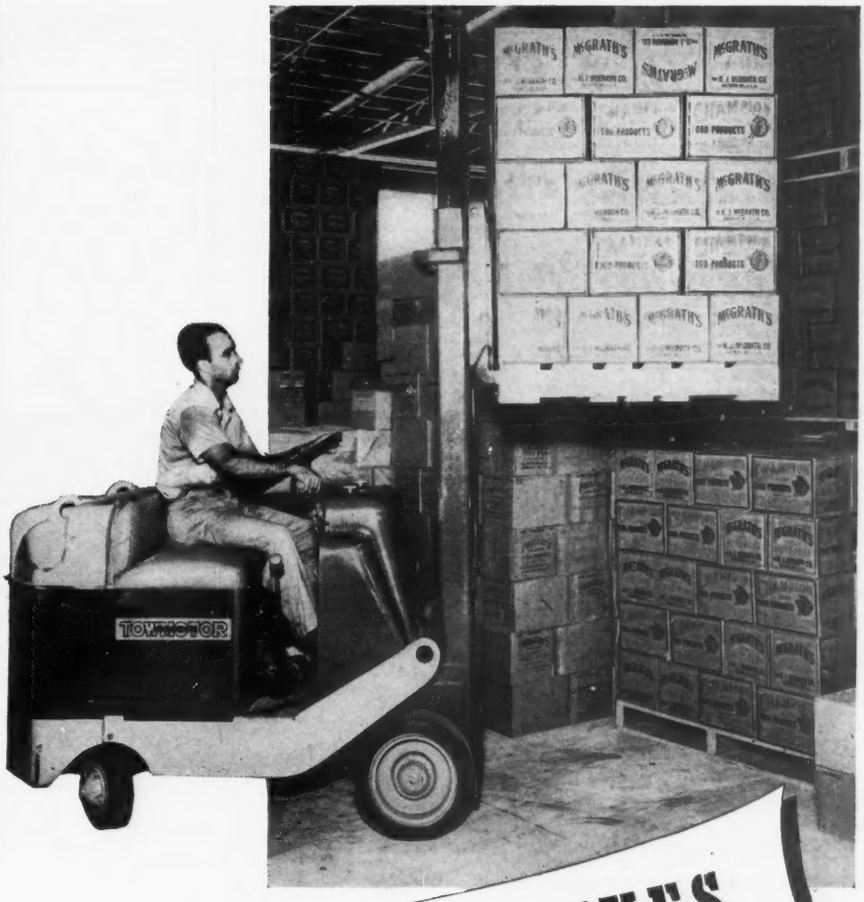
Tanks of these materials are supplied for storage of water, oil and chemicals and for various solutions such as

Agitated tanks made of wood to conserve metal.

are used in pickle processing, vinegar manufacture and for many other purposes. They include all shapes and sizes in capacities up to 100,000 gal.

Precision Balances

Roller-Smith Co., Bethlehem, Pa., has introduced two new models of precision balances developed to meet the need for accurate weighing by unskilled or semi-skilled workers. These balances, which are available in various sizes for weights ranging from less than 3 milligrams to more than 50 grams, are modi-



PEAS ... AND CUES

Take your cues for faster loading, quicker stacking, more usable space and more efficient manpower from the way Towmotor handles a heavy unit load of peas.

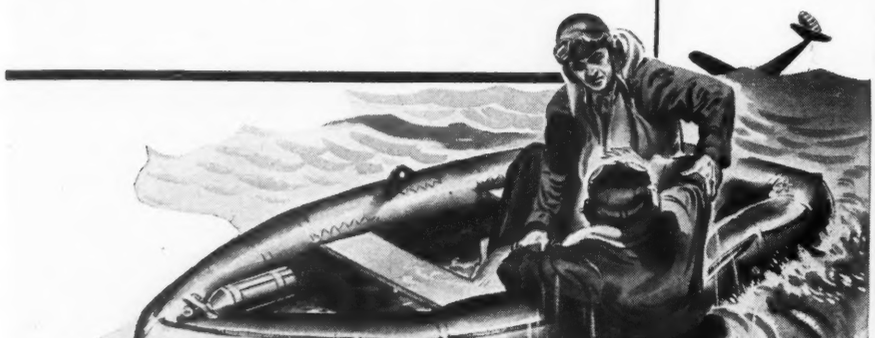
This "one man gang" picks up 1,000 to 10,000-pound loads in one operation . . . scoots them along narrow aisles as fast as 10 miles an hour . . . maneuvers in cramped quarters and builds stacks as high as 25 feet. That's Performance with a capital "P"!

There are 1001 production and warehousing applications for this mechanized time and money saver; there are problems you can lick with Towmotor. A new manual "The Inside Story" gives the facts. For a free copy write direct to Towmotor Corporation, 1222 East 152nd Street, Cleveland, Ohio.

TOWMOTOR

THE 24-HOUR ONE-MAN-GANG

When fliers take to boats they use a deep-drawn cylinder



This cylinder is only one of many and varied Hackney deep-drawn shapes now in active war service. Not only does deep drawing assure an improved product, but it also effects considerable savings in material, man-hours and equipment.

Fliers forced down at sea use a deep-drawn cylinder to inflate rubberized boats which keep them afloat until rescued. The inflation is accomplished by compressed carbon dioxide stored in the deep-drawn lightweight cylinders.

Hackney Drums and Barrels

The above description is of a Hackney product now being used extensively in the war effort. Products such as these are demanding more and more of Pressed Steel Tank Company's facilities. Hackney Drums and Barrels are now serving in hundreds of war plants. By helping to solve the transportation problems for vital foods, Hackney Containers are hastening the day when their advantages can be made available to all businesses.

And when we can again return to the pursuits of peace, the experience gained by Hackney in the war will be reflected to your advantage. All the knowledge gained in producing new products—all the research instituted in the search for new solutions—will be put to work producing better, high-quality drums and barrels for you.

Pressed Steel Tank Company

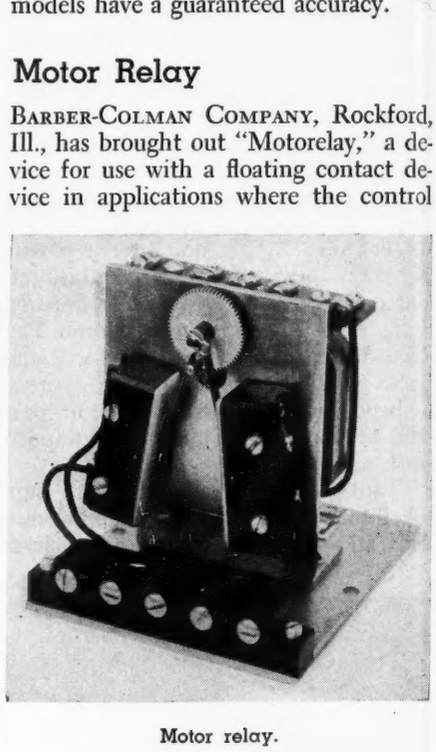
General Offices and Factory · 1457 SOUTH 66th STREET
Milwaukee, Wisconsin

DEEP-DRAWN
SHAPES AND SHELLS

fied designs of the Model B balance produced by this company. One of the designs is designated Model B-1 and is available in double-hook type. The other balance, Model MB, can be furnished in single hook or double hook type. The only other difference between the two models is that the Model MB balance is provided with a weighing chamber to protect the hook and weighing sample from air currents. Both models have a guaranteed accuracy.

Motor Relay

BARBER-COLMAN COMPANY, Rockford, Ill., has brought out "Motorelay," a device for use with a floating contact device in applications where the control



Motor relay.

current exceeds the contact rating of the controlled instrument. The construction of this device includes a shaded pole, a reversible gear-head motor, totally inclosed switches and a switching mechanism. Where desired, a drawn steel cover is available. Switch contacts have a non-inductive load capacity of 10 amp. at 110 or 230 volts, a.c. Controlled circuit current is 0.5 amp. at 25 volts.

Insecticide

AN ODORLESS insecticide called "Completex" is being distributed by Completex Sales Co., 132 W. 43d St., New York City. This is a two-fold product involving the use of both liquid and powder. According to the manufacturer, if the liquid and powder are used according to instructions, they will completely eliminate such vermin as roaches and ants after a period of ten days to two weeks. The insecticide is said to be composed entirely of domestic chemicals which are not essential to the war effort and as a consequence are available. It is said to be odorless and completely harmless to humans and warm-blooded animals.

Questions & Answers

Corn Chips

A subscriber in California needs a formula for corn chips.

We are unable to supply a definite formula, but can suggest several possible procedures.

One method is to start with whole or half-grain hominy, which must be soaked or cooked in salted water until well soaked but not mushy. Remove external water. Run the corn through rolls to obtain a flake form. Cook in deep fat as you would potato chips. Another way is to start with grits or ground hominy, like a very coarse corn meal. Cook to give a decidedly thick mush, which is run into pans and spread in a layer not more than ⅛ in. thick and cooled. When thoroughly cooled and set, cut into strips of the desired width and cook in deep fat. Or the prepared hominy can be extruded as a ribbon into a vat of hot fat and mechanically submerged for the cooking period.

The corn mass must be seasoned and any required flavor added before it is put into the fat for cooking.

The fat should not be above 350 deg. F. at the beginning of the cooking period and must not fall below 280 deg. F. during cooking. Too high a temperature will cause bursting of the corn particles, while too low a temperature gives a greasy product.

Poultry

An engineering company in New York is interested in manufacturers of machinery for eviscerating poultry.

Poultry being taxed for interstate shipment is subject to Federal inspection, and as a result the dressing is done by hand, so that the entrails may accompany the corresponding bird past the inspection point. The articles in our October and November, 1942, issues cover what we believe is the best modern practice in poultry packing.

Dipping Chocolate

A New York chocolate broker asks if there is anything we can suggest to make dipping chocolate for ice cream bars out of cocoa or unsweetened liquor chocolate, together with some coconut oil.

Ice cream dipping chocolate can be made from either cocoa or chocolate liquor merely by adding a sufficient amount of cocoa butter or 92-deg. melting point coconut fat. From a practical standpoint it is better for the fat to be added to chocolate liquor. Addition of this fat to cocoa powder entails subsequent roll refining or passing through a homogenizer or colloid mill to get proper incorporation of the cocoa solids into the fat and to reduce the graininess which otherwise is found in the mixture.

The amount of fat to add depends upon the thickness of the coating desired on the individual bar. For a bitter coating, the layer of chocolate should not be thicker than that produced by a coating with 60 percent fat content. Even a 60 percent fat coating might be too thick if made from a liquor in which the less desirable cocoa beans are used predominantly.

Commercial chocolate liquor contains on the average about 52 percent fat. That means that about 20 lb. of either 92-deg. melting point coconut fat or cocoa butter should be added to bring the total content up to approximately 60 percent.

In case there is a too strong after-taste, 60 lb. of added fat will have to be used to give a coating of 70 percent total fat. Approximately 37 lb. of fat gives a coating with 65 percent total fat content.

In case cocoa powder is used, the calculations all have to be made on the basis of the fat content of the cocoa powder. That might range anywhere from 5 or 6 percent to as much as 26 percent total fat.

Uses for Gluten

Uses to which gluten can be put, other than for improving bread, are requested.

While some gluten is used for improving bread, and some used for the manufacture of glutamic acid and its various salts, a far greater quantity is used in the making of diabetic and health foods.

Prior to the war a large proportion of the gluten used in the United States was imported.

Dessert Powders

Information on the best type of equipment to use and how to incorporate the ingredients in dessert powders is needed.

The ingredients are all dry and powdered. If liquid flavoring is used it should be absorbed in the dry ingredients before blending. It is very important to regulate the fineness of the product in order to prevent segregation.

The blender is generally a trowel-type mixer, or the type known as a MacLellan mixer.

DON'T HIGH-HAT A PAPER BAG!

...it may be just the answer to your food Packaging Problem...

We realize that some of the leading food producers are using Paper Bags because of the shortage of tin, glass, etc., but many will continue using Paper Bags *because they do the job.* We make moisture, gas, and grease-proof bags, big and small bags, glassine, cellophane, waxed, and special bags for many food products.

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BOOKLETS • LITERATURE • BULLETINS

FOOD PLANT EQUIPMENT

Conveyor Belts—"Wisco Metal Conveyor Belts" is the title of a 23-page illustrated catalog giving brief accounts of construction and materials recommended for various types of conveyor belts, many in food plants; issued by Wickwire Spencer Steel Co., 41 East 42 St., New York, N. Y.

Dehydration Equipment—Designed to meet U. S. Army Quartermaster specifications, the "Brilsonair" dehydrater is described, illustrated and diagrammed in a 12-page catalog, "Food Dehydration Simplified," that also contains a production, time and temperature schedule; issued by Bridges-Wilson Corp., 206 Massachusetts Ave., Arlington, Mass.

Kettles—Tables of dimensions based on gallon capacity for two-thirds jacketed, full jacketed stationary and two-thirds jacketed trunnion type kettles may be found in a brief folder issued by Lee Metal Products Co., Inc., Phillipsburg, Pa.

Processing Equipment—A 24-page book, No. 236, containing photographs of materials handling and processing equipment is published by Whiting Corp., Harvey, Ill., under the title "Whiting Products for Industry."

Refrigeration Equipment—Illustrated in this 8-page bulletin, No. 450-A, entitled "Ice and Frost," are different Frick installations on vessels of various classes; published by Frick Co., Waynesboro, Pa.

Sanitary Pumps—A 4-page bulletin illustrating and describing sanitary pumps used in food and beverage processing plants is issued as Bulletin 115 by Blackmer Pump Co., Grand Rapids, Mich.

PLANT SUPPLIES

Alloys—A 16-page bulletin, "Engineering Properties of "K" Monel," describing physical properties, working instructions, thermal treatment and principal applications, and giving technical data on mechanical property ranges, illustrated by tables, is issued by International Nickel Co., Inc., 67 Wall St., New York, N. Y.

Boilers—The 8-page reprint, "Conditioning Feed Water for High Pressure Boilers," by Austin C. Dresher, discussing methods employed in feed-water conditioning, requirements met in conditioning boiler feed water, as well as the importance of scale removal and corrosion, is being distributed by Cochrane Corp., 17th & Allegheny Ave., Philadelphia, Pa.

Chain Drives—A brief factual folder No. 1951, on emergency measures to keep "chain drives" running, has been issued by Link-Belt Co., 307 N. Michigan Ave., Chicago.

Drive Belts—Suggestions for obtaining utmost service from V-belt and flat-belt drives, with blueprints, drive-selection and dimension tables, are published in a 36-page catalog, under the title "American Econ-O-Matic Drives," by American Pulley Co., 4200 Wissahickon Ave., Philadelphia, Pa.

Fire Equipment—Information and illustrations to assist in proper maintenance of fire extinguishers is found in the folder published by Pyrene Manufacturing Co., 560 Belmont Ave., Newark, N. J., entitled "Directions for Inspecting, Recharging and Maintaining Portable Fire Extinguishers."

Fire Extinguishers—In line with the protection of defense industries, a circular describing its new product, "Tam-Pruf Cabinet," is published by Erie Supply & Equipment Co., P. O. Box 1182, Sandusky, Ohio.

Fire Protection—An information sheet, Brief No. F-62, summarizing first-aid fire protection with fire barrels freeze-proofed with calcium chloride, has been issued by Calcium Chloride Association, 4145 Penobscot Bldg., Detroit, Mich.

PACKAGING

Barrels—"Inside the Hoops—A Guide to Better Cooperage," a book containing 40 pages of pertinent information for those who pack food products in barrels, kegs or similar containers, with illustrations and specification tables, has been issued by Northern Cooperage Co., Concord & Page Sts., St. Paul, Minn.

Corrugated Boxes—Seventeen solutions to shipping problems for manufacturers engaged primarily in war work, together with a list of various other materials packed in corrugated boxes, will be found in a 20-page "packaging library" booklet, "How to Pack War Materials," issued by Hinde & Dauch Paper Co., Sandusky, Ohio.

Corrugated Containers—A 32-page booklet entitled "Paperboard Goes to War," illustrating by photographs the use of various types of containers for dehydrated foods, U. S. Army field ration units, tank parts and ammunition, is issued by Container Corp., of America, 11 West Washington St., Chicago.

Labels—The 4-page Bulletin No. 2, entitled "War Production Labels," illustrating labels used by outstanding war producing plants, and the 48-page catalog "Ever Ready Labels 'Go Places and Do Things' "—528 label ideas of time and labor saving suggestions—are issued by Ever Ready Label Corp., 141 East 25th St., New York, N. Y.

Steel Strapping—The 12-page issue, No. 9, of Acme Process News, describing and illustrating various methods of reinforcing shipments of food products and containing interesting applications of steel strapping and stitching wire, is published by Acme Steel Co., 2840 Archer Ave., Chicago, Ill.

Steel Strapping—Stowage and reinforcement in freight cars of such products as barrels and crates, through the use of Gerrard round steel strapping, is illustrated and described in the 8-page booklet, edition No. 2, by Gerrard Co., Inc., 4701 South Richmond St., Chicago.

CONTROL EQUIPMENT

Control Equipment — New specification sheets on two Carrier cold diffusers, types 15T and 15Q, for the preservation of perishable products in wholesale food storage, have been issued by Carrier Corp., Syracuse, N. Y.

Control Equipment—A 45-page illustrated catalog, N-33C, entitled "Micromax Resistance Thermometers for Measurement and Control," describing typical industrial applications, thermometer principles correctly applied, data on temperature ranges and various indicators and recorders, has been issued by Leeds & Northrup Co., 4907 Stenton Ave., Philadelphia, Pa.

Control Instruments—"Stokes Portable High Vacuum Gages" illustrates high vacuum gages for use either as portable instruments or on fixed mountings, and contains a complete description of gages, specifications and prices, and is published by F. J. Stokes Machine Co., Olney, P. O. Philadelphia, Pa.

Process Control—A 64-page illustrated bulletin, entitled "The Technique of Precision Control in Industrial Processing," prepared for the purpose of acquainting engineers, operators and others with the application of automatic control to industrial processes, and including information on precision measurement, fundamentals of control, types of control, control valves and applications, has been issued as Booklet 80-1 by the Brown Instrument Co., Wayne & Roberts Aves., Philadelphia, Pa.

Temperature Control—A line of universal controllers for temperature control applications, including pyrometers, potentiometers and thermometers, is described and illustrated in Vol. 2, No. 2, of *Wheelco*

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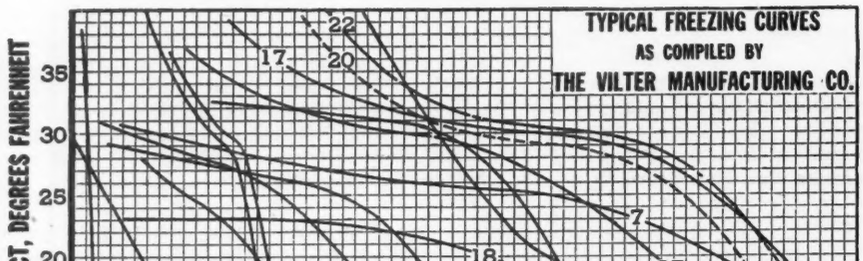

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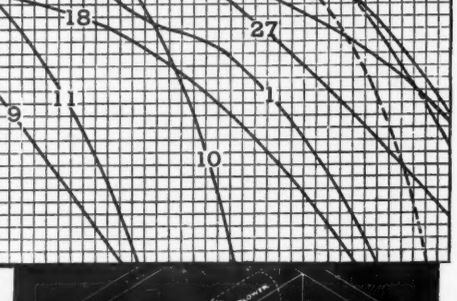

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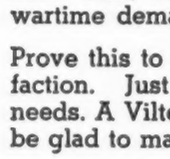

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Comments, published by Wheelco Instruments Co., 846 W. Harrison St., Chicago.

MISCELLANEOUS

Bakery Sanitation—A 24-page illustrated booklet dealing with the problem of protecting bakery product quality and prolonging the life of equipment, through the use of "Oakite" cleaning and sanitation technic in the bakery, has been issued by Oakite Products, Inc., 22 Thames St., New York, N. Y.

Cleaning—The use of "Roccal" for various cleaning and sanitation purposes is discussed in a series of leaflets and reprints issued by Alba Pharmaceutical Co., Inc., 74 Laight St., New York.

Cleaning Handbook—A 42-page illustrated book entitled "Food Plant Cleaning Handbook," dealing with cleaning materials and discussing the cleaning problems of bottling plants, canneries, confectionery plants, dehydrated-food plants, edible-oil plants, frozen-food plants and meat-packing plants, treating problems of bottle washing, equipment cleaning and building cleaning, has been issued by Magnus Chemical Co., Inc., Dept. F, Garwood, N. J.

Dairy Sanitation—"Modern Trends in Dairy Sanitation," No. 366, and "Cleaning and Sterilizing Dairy Plant Equipment," No. 367, are the titles of two technical bulletins issued by Diversey Corp., 53 West Jackson Blvd., Chicago, Ill.

Conveyor Lubrication—A product for the lubrication of conveyor chains, developed to keep these chains clean, sanitary and free from black gummy deposits, particularly for use on conveyors in food plants, called "Composition No. 6," is described in a bulletin, Form 4422-R1, issued by Oakite Products, Inc., 22 Thames St., New York, N. Y.

Lubrication of Bearings—A 28-page illustrated bulletin dealing with the lubrication of ball and roller bearings by various available methods, and with such subjects as protection of bearings against moisture and cleaning methods, has been issued under the title of "A Guide to Better Bearing Lubrication," by SKF Industries, Inc., Front St. & Erie Ave., Philadelphia, Pa.

Motor Finder—A "Motor Finder" slide rule to facilitate choosing the correct type squirrel-cage motor, according to the operating conditions and characteristics of the motor, has been published by Allis-Chalmers Manufacturing Co., Milwaukee, Wis.

V-Belt Drive Conservation—A 14-page illustrated bulletin entitled "Twenty-three Ways To Conserve the Life of Your Multiple V-Belt Drive," issued to help users in the proper selection, installation and maintenance of this equipment, has been issued by the Multiple V-Belt Drive Association, 140 South Dearborn St., Chicago, Ill.

British Food Industry Geared to War Economy

(*Continued from page 51*)

British experience in food restriction points to the fact that adequate control of food manufacturing involves control of raw material supplies and their allocation to the food manufacturing trades. Information from the food manufacturers as to their past and present output is also necessary.

Transportation

In the food industry is one of the best examples of Britain's transport economy, which is effectively based upon a system of zonal and transport pools.

In October, 1941, the Ministry of Food issued an order giving it control over all transport of food and animal feeding stuffs with power to prohibit movements of food, to specify methods and routes of transport, to name the time at which consignments should be made in moving food between particular parts of the country, and, where food is moved between particular areas, to name the actual place of consignment and destination.

This order also enabled the Ministry to direct food traffic so as to avoid congestion of railways at places where the traffic for a particular time might be especially heavy, to time the transportation of food in order to insure efficient and certain deliveries to consumers, and to spread large movements of foodstuffs over all transport services.

These powers have been used only where necessary to enforce compliance with schemes for avoiding unnecessarily long hauls of foodstuffs or cross-movements of foodstuffs in opposite directions.

Although plans for a zone or sector system for food distribution were introduced by the Ministry of Food in June, 1942, the scheme did not go into effect until August, 1942, owing to delay caused by a large-scale registration of retailers and wholesalers. Under this zone system the country is divided into nine sectors. Apart from a few neutral areas, food wholesalers can supply only the retailers in their sector. (The term "food," it should be noted, includes all articles used as a food or drink for human consumption, other than water. It also includes any substance ordinarily used in the composition or manufacture of human food as well as any flavoring matter or condiment.)

Prior to the nation-wide compulsory scheme for sector distribution, the Ministry of Food had already effected considerable economies in transport by arranging schemes for traders to pool their resources and restrict deliveries. In the northwest section of London, for example, 36 such schemes have resulted in a weekly saving of 119 motor vans, 26 private cars, 1 lorry, 17 horse vans, 19 handcarts, 185 bicycles and tricycles, 281 workers and 1,000 gal. of petrol.

The cocoa, chocolate and confectionery industry had worked out with the Food (Defense Plans) Department a pooled system of transport before the war. Upon the outbreak of war this was put into operation by all the large firms and gradually extended until it now covers the great bulk of manufacturers' distribution which is not purely local. Manufacturers' railroad depots are pooled and goods are sent in bulk by rail to these depots, from which they are distributed by pooled motor transport in the local areas surrounding these depots.

Certain types of goods (such as cocoa butter and chocolate coating) and certain particular types of outlet (such as service canteens and multiple stores) are supplied from the area in which the goods are produced. Other agreements provide for a certain amount of inter-production by one firm for another.

(*Turn to page 116*)

Chosen for Some of the Toughest Sifting Jobs

Operating on continuous 24-hour duty, Bar-Nun Rotary Sifters have proved their ability to produce uniform complete separations month after month with minimum attention, power and maintenance costs. First installations in many plants have resulted in orders for additional units. Made in 9 sizes, 4 to 60 square feet of cloth surface. Write today for complete information.

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Makers of equipment for grinding, sifting, mixing, feeding, and weighing, dry food products.

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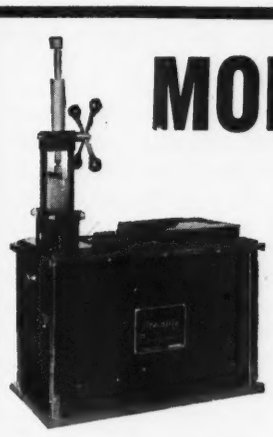
Food Dehydrators Choose Speedy Steinlite



STEINLITE one-minute Moisture Tester . . . electrical in principle . . . easy to use . . . saves money . . . speeds production . . . accuracy guaranteed.

Used in processing and in the laboratory . . . Steinlite successfully tests dehydrated vegetables, eggs, meats . . . most any ground or powdered product in one minute. Sample not damaged. Saves time and money.

Guaranteed accurate to .2 of 1% with a moisture range of 1 to 35%. Over 2800 users and a good performance record in the food industry.

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Large transport economies have also been effected in the soft drink industry by direct and indirect methods. The direct method is by use of the zone system and pooling of transport, while the indirect method effects a reduction of volume by making concentrated drinks instead of ready-to-drink beverages. Through concentration the industry will be able to reduce the gallon output of 150,000,000 by one-third, thus saving nearly 750,000 tons of transport (calculating about 30 lb. to a gallon, including the bottles and crates).

Building Dehydration Plants

Methods of concentrating foods include dehydration, which has proved most useful in saving storage space as well as in economizing on transportation. The Ministry of Food is at present engaged in setting up 15 dehydration plants with the expectation of a considerable increase in this number. The total annual capacity of these 15 plants is estimated at about 7,500 tons of mixed dried vegetables. It will take about 140,000 tons of fresh vegetables to supply that amount of dehydrated food. The plants are of a simple tunnel type and are being installed in existing factories which have the necessary facilities. Production will be controlled by the Ministry in order to secure and maintain the required standard of quality. The output of the plants will be taken over by the Ministry for distribution.

While deyhdrated food has been "tested" by civilian consumption and accepted enthusiastically, it is expected that the distribution in the coming spring will be limited to the armed forces and certain emergency services.

In addition to the drying of vegetables for direct human consumption, surplus potatoes are dried for use as animal feeding stuffs and could also be used for the production of flour suitable for inclusion in manufactured foods or as a dilutent in bread. It is estimated that approximately 700,000 tons of raw potatoes could be processed annually in this way in existing plants in Great Britain and on the plants now being built in Northern Ireland.

Technologists Improvise To Meet Shortages

(*Continued from page 57*)

minutes and stirred all the time. Only 8 oz. of soya flour is required. This and the sugar are made into a thin paste with water and added to the wheat-flour paste. The whole mixture is heated to 180 deg. F. and held there for 5 minutes before adding the corn flour, which also has been made into a thin paste, using the remainder of the cold water. Heating is continued until thickening occurs, after which the mix is cooled, flavored and frozen in the ordinary way.

When spray-dried whole egg was procurable it was found advantageous to use 1 to 3 oz. per gallon of mix.

Ice Cream Without Milk

Turning now to ice cream proper, the wartime product had to be made without the aid of milk or milk products, and with about half the amounts of fat and sugar ordinarily used. In the great majority of cases, butter and margarine were unobtainable, so that a vegetable fat, the so-called "100 percent substitute fat," had to be used.

The standard wartime formula worked out by Feltham and Humphries was based on wheat flour. The manufacturing procedure was as follows. The wheat flour, roughly 10 percent of the total mix weight, is made into a thin paste with cold water, and about 11½ percent of the mix weight of sugar and a little salt are added. A quantity of malt extract, little more than an ounce per pound of flour, depending on the diastatic activity, is diluted with cold water and divided into two portions. One portion of the malt extract is added to the flour mix and warmed to 155 deg. F., and then the other portion is added, stirring gently all the time. The temperature is held at 150 deg. F. for 20 minutes, after which a solution of sodium alginate stabilizer (0.25 percent) is added, together with any water left over. Finally the butter, margarine or substitute fat emulsified with lecithin or glycerin monostearate, is stirred in. The mix at 150 deg. F. is homogenized at a pressure of 3,000 lb., then is cooled, flavored, aged, frozen and hardened in the usual way.

The presence of gluten in wheat flour leads to the gumming up of the agitator and the homogenizer filter if agitation is too violent. The changeover to 85 percent extraction flour introduced another set of difficulties, owing to the presence of particles of bran which tend to clog up filters and strainers and to give the ice cream a darker and somewhat speckled appearance. After numerous experiments, Feltham and Humphries recommended that the amount of wheat flour be decreased by replacing about half of it with soya flour and corn flour or potato flour.

In cases where malt extract was difficult to obtain, dried malt extract, malt flour or diastatic flour was used instead.

The most satisfactory fats were considered to be refined deodorized palm kernel or coconut oil, or hardened oils. As an emulsifying agent for these, glycerine monostrearate was found to be better than lecithin. Also, it was an advantage to use a "butter flavor" with these fats.

Sweeteners

As corn sweeteners were no more easy to get than ordinary sugar, they had little interest for the ice cream manufacturer in wartime Britain. Certainly they have not evoked anything like the attention which they are receiving in the United States. This, of course is not to say that we are unacquainted with the work of Dahlberg and others on sweetening values, and under normal conditions this would have been found extremely useful. Instead, many manufacturers had to resort to saccharin to eke out the sugar supply. The soluble sodium salt is preferable and is considered to be about 450 times as sweet as sugar. Owing to the fact that saccharin adds practically nothing to the solids content, it is generally considered that not more than one-third of the sugar content can be replaced by saccharin. In a 10-gal. batch of mix, containing 12 lb. of sugar, Feltham and Humphries state that 7½ lb. of sugar plus ⅛ oz. of soluble saccharin could be used. A mixture of 1 part of soluble saccharin and 15 parts by weight of powdered dextrose is said to be about 30 times as sweet as sugar, and such a mixture, kept airtight, was employed by some manufacturers.

Other manufacturers used mild flavored honey to replace up to 25 percent of the sugar. In some cases, low-grade honey was mixed with glucose or invert sugar. One large plant successfully produced a honey cream in which the honey and vanilla flavors were nicely blended.

Salts and Stabilizers

It will be noticed that a small amount of salt (sodium chloride) was incorporated in the formula. Better results are stated to follow from the use of a mixture of equal parts of sodium chloride, sodium citrate and disodium hydrogen phosphate to the extent ½ percent of the total weight. Humphries states that the sodium citrate serves to control the viscosity to some extent by precipitating the calcium ion when sodium alginate is used as a mix stabilizer.

As regards the stabilizer, it was found that sodium alginate, or even Irish moss, gave a better overrun than gelatine. The incorporation of spray-dried whole egg improves the overrun and palatability.

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NO need for substitutions . . . all three Armstrong Insulating Materials are available now for prompt delivery! They're ready to meet your insulation needs. Ready, too, are the long experience and engineering skill found only at "Insulation Headquarters." Here you'll get help in selecting the right material. And you'll be *sure* that it's right because Armstrong engineers have a long and successful record in low temperature insulation work.

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Armstrong's CORKBOARD: Available on A-10 or better priority. Years of service under severe conditions give proof that Corkboard is an efficient, low temperature insulation. It is light, strong, rigid. Standard size 12″ x 36″, thicknesses 1″, 1½″, 2″, 3″, 4″, 6″. Highly resistant to moisture and common forms of deterioration, Corkboard gives dependable protection for all low temperature applications.

Armstrong's MINERAL WOOL BOARD: Available with or without priority. Here is an efficient heat barrier processed into structurally strong boards from mineral wool and a strong waterproof binder. These boards can be quickly and easily installed. They stay in place without sagging, settling, shrinking, swelling, or warping. Armstrong's Mineral Wool Board is free from objectionable odor and from any liability to rot, mold, or harbor vermin. Size 12″ x 36″, thicknesses 1″, 1½″, 2″, 3″, 4″.

Armstrong's FOAMGLAS: Available with or without priority. Thousands of tiny airtight cells make up this new form of glass. The slight vacuum in these cells forms a *permanent* heat barrier. Foamglas is *waterproof*, but even more important, it's *vaporproof!* Light in weight and easily workable, Foamglas is rigid and has unusual compressive strength—130 lbs. per square inch! In addition it's fireproof, verminproof, and odorless. Block sizes 12″ x 18″, available thicknesses 2″, 3″, 4½″, and 6″.

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BOOKS

How Foods Are Frozen

THE FREEZING PRESERVATION OF FOODS. By D. K. Tressler and C. F. Evers. Published by the Avi Publishing Co., 31 Union Square., New York, N. Y., 1943. 765 pages; 5½x8¼ in.; cloth. Price $8.

Publication of this book brings together in one volume extensive information for technologists and plant operators concerned with the freezing of food. The material is well organized and gives an up-to-date picture of freezing methods and technology.

It is also of value to home economists and dietitians interested in the vitamin content of frozen foods, and is useful to those who operate community locker plants. Described in the edition are the various freezing processes; methods of preparing fruits, fruit juices, vegetables, meat, poultry, fish, shellfish, and dairy products; and packaging materials and methods. The authors also discuss the nutritive value of frozen foods; storage and transportation of frozen products; and the importance of quality control through the proper selection of high-quality raw materials.

Some of the chapters on the freezing of fruits and vegetables are pertinent to dehydration, because some of the methods used in preparing fruits and vegetables for freezing are fundamently the same as those employed in preparing products for dehydration.

Many chemical, physical and bacteriological methods of examining frozen foods are discussed in the Appendix, and the authors have presented excellent bibliography material to be used in obtaining additional information on frozen foods.

Vitamin Research

THE APPLICATION OF ABSORPTION SPECTRA TO THE STUDY OF VITAMINS, HORMONES AND COENZYMES. By R. A. Morton. Published by Adam Hilger, Ltd., 98 St. Pancras Way, Camden Rd., London, N.W. 1, England. 226 pages; 5¾x8¾ in.; cloth. Price, $6.50.

This book is strictly for the technologist, being quite scientific in its treatment. The author reviews many important papers based upon original and painstaking research and records the advances made in the use of absorption spectra in this type of work.

In more recent years, the use of absorption spectra has become a versatile tool of the technologist, and one chapter of the book explains the significance and application of this tool. Other chapters are devoted to studies of provitamins and vitamins, antioxidants, proteins, and enzymes and coenzymes.

Book for Bidders

BIDDER'S REFERENCE BOOK. Published by the Office of the Quartermaster General, 1942. 68 pages; 5¾x9¼ in.; paper. Price 15 cents; for sale by Superintendent of Documents, Washington, D.C.

Standard instructions with which bidders must comply in submitting informal bids to the Quartermaster Corps are contained in this pamphlet. Also given are all the usual contractual provisions which are incorporated in Quartermaster supply contracts. In fact, when requests for informal bids are issued by the Quartermaster Corps., they refer to specific instructions and provisions in this reference book.

Grades of Livestock

MARKET CLASSES AND GRADES OF LIVESTOCK. Published by the Agricultural Marketing Administration of the Department of Agriculture as Bulletin No. 1360, 1942. 30 pages; 5¾x9¼ in.; paper. Price, 10 cents; for sale by Superintendent of Documents, Washington, D.C.

Aside from livestock growers, this pamphlet is principally of interest to meat packers. The bulletin outlines and explains briefly the United States standards for market classes and grades of the various kinds of livestock commonly used as food animals, and it defines or discusses the standard market terms associated with such classes and grades.

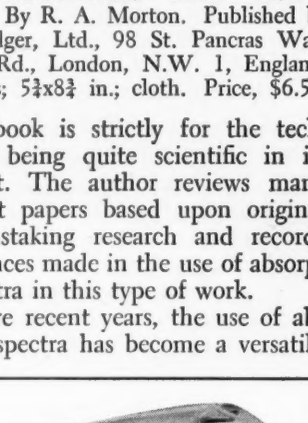
Fundamentals of Nutrition

THE FOOD YOU EAT. By Samuel and Violette Glasstone. Published by the University of Oklahoma Press, Norman, Okla., 1942. 266 pages; 6x8¾ in.; cloth. Price, $2.25.

Those in the food industries who are thoroughly familiar with the nutritional values of various foods probably will not find much in this book that they do not already know. But for the nutritionally uninformed it offers a background of fundamental facts that no one in a responsible position in the food business should be without. Now as never before it is the duty of food processors to give the public food with the proper nutritional values.

Written as a practical guide to home nutrition, the book devotes chapters to health, hunger and nutrition; the human machine, digestion; mineral elements and water; vitamins; and food products.

Sealtite SEALS IT RIGHT



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★ They use any standard gusseted paper bag.

★ Fully automatic, SEALTITE has reduced packaging costs as much as $300.00 per month per machine.

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PATENTS

Bread Dough Made to Contain All Ingredients Excepting Salt, Which is Added at Completion of Dough-making Operations and Just Before Dividing Into Loaf Units.—Elmer M. Moore to Campbell Taggart Research Corp., Kansas City, Mo. No. 2,303,488. Dec. 1, 1942.

Calcium Tartrate Made From Suspension of Material Containing Potassium Hydrogen Tartrate—Geza Braun, to Standard Brands, Inc., New York, N. Y. No. 2,303,602. Dec. 1, 1942.

Tartaric Acid Produced in Suspension of Calcium Tartrate in Concentrated Tartaric Acid Solution—Geza Braun, to Standard Brands, Inc., New York, N. Y. No. 2,303,603. Dec. 1, 1942.

Cream of Tartar Recovered From Liquors Containing Tartaric Acid Derivatives—Geza Braun, to Standard Brands, Inc., New York, N. Y. No. 2,303,604. Dec. 1, 1942.

Cream of Tartar Prepared From Purified Acid Extract of Tartarous Material—Geza Braun, to Standard Brands, Inc., New York, N. Y. No. 2,303,606. Dec. 1, 1942.

Tartaric Acid Produced by Treating Calcium Tartrate With Sulphuric Acid in Presence of Reactive Calcium Salt for Removal of Excess Sulphuric Acid—Geza Braun, to Standard Brands, Inc., New York, N. Y. No. 2,303,607. Dec. 1, 1942.

Fish and Fish Livers Treated With Ammonia Solution and Preservative Reagent Preparatory to Subsequent Recovery of Oil Content—Herbert Hempel, Essex, Mass., to Gorton-Pew Fisheries Co., Ltd., Gloucester, Mass. No. 2,303,740. Dec. 1, 1942.

Pineapples Sorted and Handled by Mechanical Means—Robert J. Newton, Honolulu, Hawaii, to California Packing Corp., San Francisco, Calif. Nos. 2,303,754 and 2,303,755. Dec. 1, 1942.

Citrus Fruits Subjected to Surface Abrasion for Removal of Wax and Oil Cells Preliminary to Extraction of Juice by Auger Compression in Atmosphere of Non-oxidizing Gas—Buren Jackson Smith, Washington, D. C. No. 2,303,768. Dec. 1, 1942.

Vegetable Protein Isolated From Soya-meal Water Extract by Treating With Caustic Alkali and Lime Preliminary to Centrifuging and Digesting—Percy L. Julian, Maywood, and Bernard T. Malter, Chicago, Ill., to Glidden Co., Cleveland, Ohio. No. 2,304,099. Dec. 8, 1942.

Soya Protein Solution Given Low pH Value Through Addition of Water-soluble Polyhydric Alcohol—Percy L. Julian, Maywood, Andrew G. Engstrom, Chicago, and Elmer B. Oberg, Evanston, Ill., to Glidden Co., Cleveland, Ohio. No. 2,304,102. Dec. 8, 1942.

Chewing Gum Product Made to Have Gum Center With Plurality of Soluble and Substantially Insoluble Layers as Coatings, One Substantially Insoluble Layer Consisting of Charcoal—Edward E. Ekert, Rego Park, N. Y., to American Chicle Co., Long Island City, N. Y. No. 2,304,246. Dec. 8, 1942.

Casein Precipitated by Spraying Concentrated Acid Into Rapidly Moving, Swirling, Thin Stream of Skim Milk—John R. Spellacy, Burlingame, Calif., to Hercules Powder Co., Wilmington, Del. No. 2,304,429. Dec. 8, 1942.

Plastic Shortening Made to Consist of Approximately 80 to 95 Percent Edible Liquid Vegetable Oil and 5 to 20 Percent of Hard Fat Having Titer of Not Less Than 65 Deg. C.—Arne Gudheim, Leonia, N. J., to Lever Bros. Co. No. 2,304,452. Dec. 8, 1942.

Yeast Grown in Nutrient Media With Initial Temperature of About 86 Deg. F. Followed by Temperature of About 75 Deg. F. for About 6 Hours and Final Temperature of About 86 Deg. F. for 2 Hours—Ejnar Alfred Meyer, Epsom, and Percival William Chaffe, Burgh Heath, England, to Standard Brands, Inc., New York, N. Y. No. 2,304,471. Dec. 8, 1942.

Sucker Confections With Raised Design on Each Sucker Mechanically Formed in Continuous Manner—Edward E. Cahoon, Racine, Wis. No. 2,304,494. Dec. 8, 1942.

Partially Cured "American" Cheese Packaged in Small Units Using Gas-retaining Flexible Wrapper Consisting of Rubber Hydrochloride Laminated With Metal Foil—Clifford B. Pape and James P. Langwill, Chicago, Ill., to Reynolds Metals Co., Richmond, Va. No. 2,304,591. Dec. 8, 1942.

Starchy Materials Converted Into Fermentable Carbohydrates While Passing as Suspension Through Conduit Into Which Steam is Injected—Leo M. Christensen, Moscow, Idaho, to National Agrol Co., Inc., New York, N. Y. No. 2,304,679. Dec. 8, 1942.

Beverages Mixed in Containers by Mechanical Spinning Action—James Kantor, to Liquid Carbonic Corp., Chicago, Ill. No. 2,304,734. Dec. 8, 1942.

Citrus Fruits Sorted by Electrical Conductivity to Determine Internal Decay and Condition Resulting From Freezing—Harold C. Pierce, Pomona, and John H. Clasen, Anaheim, Calif., to Harold C. Pierce. No. 2,304,765. Dec. 8, 1942.

Fatty Acid Mixture Derived From Triglyceride Oil, Subjected to Fractional Distillation to Separate Hydrogenation-inhibiting Factors Preliminary to Hydrogenation of Unsaturated Fatty Acids—John E. McKee, Western Springs, and Orlando Graziani, Chicago, Ill., to Armour and Co., Chicago, Ill. No. 2,304,842. Dec. 15, 1942.

Foods Frozen in Continuous Manner by Submersion in Direct Contact With Refrigerant Liquid—Robert B. Taylor, Knoxville, Tenn. No. 2,304,860. Dec. 15, 1942.

Fish Filleted by Mechanical Means—Fred Parsons Brown, Braintree, and Harry A. Gilbert, East Milton, Mass., to General Seafoods Corp., Boston, Mass. No. 2,304,880. Dec. 15, 1942.

Juices Extracted by Centrifugal Action During Passage of Containing Material Through Mechanical Unit Equipped With Spiral Feeder and Shredder Rotating Independently Inside of Rotating Extraction Cylinder—Clinton G. Keith, Yakima, Wash. No. 2,304,929. Dec. 15, 1942.

Canadian Patents

Liquids Pasteurized by Passage of Steam Direct Into Liquid in Heat Exchanger Connected to Injector—Richard Seligman, to Aluminum Plant & Vessel Co., Ltd., London, England. No. 406,916. Aug. 25, 1942.

Potatoes and Other Starchy Foods Canned Without Loss of Fresh Appearance by Partial Cooking in Aqueous Solution of Weak Organic Acid Followed by Canning in Salt Solution—Bowman L. Rafuse, Bridgewater, Nova Scotia. No. 407,070, Sept. 1, 1942.

Gelatine Decolorized and Clarified by Treatment in Neutral Solution with Neutral Hydrated Alumina at 55 to 75 Deg. C.—Rene J. R. Jacquet, Cortenberg, Belgium. No. 407,610, Sept. 22, 1942.

Skinless Sausages Packed in Cans by Machine Having Parallel Extrusion Orifices Fed From Meat Chamber With Delivery Ends Fitted to Cans—Wm. M. Yuill, Edinburgh, Scotland. No. 407,665. Sept. 29, 1942.

Vitamin D Preparations With High Antirachitic Potency Obtained by Separating Sterol Fraction From Chinese Duck Eggs and Activating Sterol—Albert G. Boer, Engbert H. Reerink and Aart van Wijk, Eindhoven, and Johannes van Niekerk, Leyden, to N. V. Philips' Gloeilampenfabrieken, Eindhoven, Holland, to Philips Lamps, Ltd., Finsbury, London, England. No. 407,719. Sept. 29, 1942.

Vitamin D Preparations With High Antirachitic Potency Obtained by Separating Sterol Fraction Acting as Provitamin D From Fat of Invertebrates—Johannes van Niekerk, Leyden, and Albert G. Boer, Engbert H. Reerink and Aart van Wijk, Eindhoven, to N. V. Philips' Gloeilampenfabrieken, Eindhoven, Holland, to Philips Lamps, Ltd., Finsbury, London, England. No. 408,004. Oct. 13, 1942.

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FOOD TECHNOLOGY

NEW DISCOVERIES AND INVENTIONS

DAIRY PRODUCTS

Vitamin A Value of Roquefort Type Cheese

SINGLE-FEEDING type bioassays showed no evidence that the Roquefort cheese organism *Penicillium roqueforti* produced carotene or vitamin A. Cheese samples were prepared at the same time, from the same lot of raw milk, using a modification of well-known processes.

Comparison was made between cheese ripened with mold growth and portions of the same curd which had been inoculated with the same Roquefort organism and then either prevented from ripening by holding at 0 deg. F. or ripened in vacuum cans without mold growth. All three treatments gave a product with a vitamin A value of approximately 25 I.U. per gram.

Digest from "The Vitamin A Value of Roquefort Type Cheese," by E. N. Todhunter, C. E. Roderuck and N. S. Golding, *Journal of Dairy Science*, vol. 25, 1023–26, December, 1942.

Browning of Dried Whey And Dried Skim Milk

FRESHLY dried whey is a white powder with a slight yellowish-green tinge. It is a good commercial source of vitamin G. During storage, dried whey darkens more rapidly and to a much greater degree than does dried milk. Darkening is believed to be due to a reaction between reducing sugars and proteins, yielding an end product which cannot be dissolved without first being altered chemically. The presence of the "lactose-protein" compound or of some byproducts from the reaction causes undesirable flavors in milk products.

The rate and degree of browning on storage are affected markedly by atmospheric humidity. For these tests moisture equilibrium conditions were established by holding the dried whey or dried skim milk samples in atmospheres of constant relative humidity. This method of adjusting moisture was found to be preferable to an attempt to bring all the samples to some specific moisture content determined by drying.

The degree of browning was determined by light absorption in a water or alkaline extract and also by direct color comparison with dry powder standards.

At room temperature browning is inhibited with a relative humidity less than a critical value lying between 20 and 30 percent, while above 30 percent the color developed increases with the relative humidity to a maximum between 55 and 60 percent.

Storage temperatures above 86 deg. F. markedly accelerate browning. Relatively little color developed in samples dried over sulphuric acid and then held in sealed tubes at 122 deg. F. for six months, but samples brought to moisture equilibrium at 26 percent relative humidity, then similarly sealed and stored, browned very fast. Samples held at 77 deg. F. showed no change on storage.

Both for dried skim milk and dried whey, the rate of browning at first increases and then decreases during storage.

An increase in titratable acidity and a decrease in pH accompanies browning. This is in accord with results when liquid milk is boiled or otherwise heated sufficiently to cause browning.

Digest from "Influence of Moisture on Browning of Dried Whey and Skim Milk," by H. Doob, Jr., A. Willmann and P. F. Sharp, *Industrial and Engineering Chemistry*, Industrial Edition, vol. 34, 1461–68, December, 1942.

DEHYDRATION

Significance of Enzymes

VEGETABLES for dehydration, except onions and garlic, are customarily steamed or scalded for longer periods than for freezing, to soften the texture and increase the rate of rehydration.

In these tests, toughness persisted in samples blanched at 160 deg. F. but in most cases was eliminated by blanching at 180 deg. F.

Catalase can be used as a criterion of adequacy of scalding for frozen vegetables. Dehydrated vegetables are stored at temperatures at which those enzymes not inactivated by heat during drying may continue active. Catalase was found to be unsatisfactory as a test in dehydration. Negative results did not in all cases indicate that undesirable flavors and colors had been prevented. This was particularly true with cabbage and potatoes.

Qualitative peroxidase tests with a number of reagents showed considerable variation. In general, vegetables after 3 minutes blanching at 190 deg. F. still gave positive tests, while 3 minutes at 200 deg. gave negative results except for potatoes, which required 212 deg. Carrots were faintly positive at 180 deg. and negative at 190 deg. F. Extending the blanching time to 5 minutes gave positive tests at 180 deg. and negative at 200 deg. for potatoes and cabbage; positive at 180 and negative at 190 for onions, spinach and carrots; and positive at 170, negative at 180 for peas. Cooking tests demonstrated that samples of sliced vegetables blanched in steam were of richer flavor.

Blanching had very little effect on the rate of loss of vitamin C, and it appears that the greatest portion of the loss of this vitamin during dehydration is due to nonenzymatic catalysis. This would explain the greater rate of destruction which sometimes occurs in blanched vegetables as compared to that of unblanched vegetables. Destruction of protective reducing enzymes and removal of antioxidants or inhibitors may also be a factor.

It has been found that discoloration in phenolase-containing vegetables during preparation and dehydration can be completely prevented by blanching. Losses in carotene during storage are in certain cases greatly retarded by scalding. Heating during dehydration may be sufficient to inactivate ascorbic acid oxidase, and there is some evidence that the concentration of vegetable solutes is sufficient to inactivate phenolases.

Digest from "Significance of Enzyme Reaction to Dehydration of Vegetables," by W. V. Cruess and M. A. Joslyn, 1942 *Proceedings, Institute of Food Technologists*, 99–110.

BAKING

Gluten in Doughs

A RECENT patent covers the use of specially treated corn gluten in rotary doughs. This is claimed to increase the tenderness and shortness of crackers and cookies, to replace some of the fat or skim milk powder content, and to increase the shelf-life of the bakery goods.

The corn gluten must be free from the amino acids, sulphur dioxide, unstable and rapidly fermentable soluble proteins and complex organic sulphur compounds which occur in commercial gluten meal as a result of wet milling. Purification may be accomplished by

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repeated washing of the gluten as it comes from the gluten settler, but it is better to use a destarching treatment by gelantinizing the starch at 198 deg. F. and pH 5.7, then treating with malt extract at 135 deg. F. for 5 hours, filtering, washing and spray drying. Corn gluten so treated should have about 78 percent protein.

Formulas are given for doughnuts, shortbread, wire-cut biscuits and graham crackers, using the destarched gluten.

Digest of United States Patent, 2,301,745, issued November 10, 1942, to T. J. Otterbacher, and assigned to Corn Products Refining Co., New York.

BACTERIOLOGY

Egg White Fermentation

COMMERCIALLY fermenting egg whites from various sources were found to have bacterial counts well up in the hundreds of millions. Either Escherichia or Aerobacter types predominated to such an extent as largely to exclude other types. The organisms in the eight samples examined were tentatively identified as *Aerobacter aerogenes* and *Escherichia freundii*.

Freshly broken out strained egg whites were inoculated with an inoculum from commercial fermentations of both the Escherichia and Aerobacter types. The pH rose very rapidly to 9.10 within the first 12 hours, then fell to 6.25 after 72 hours, with an accompanying decrease in sugar content. During the 72-hour period there was no apparent breakdown of the egg white protein, as shown by protein nitrogen and by combined amine and amide nitrogen values. Between 72 and 96 hours there was only an insignificant drop in sugar content and a slight decrease in bacterial count, but the pH increased from 6.25 to 6.60, and the protein nitrogen fell from 21.0 to 19.6 mg. per milliliter, showing proteolysis.

In the industry fermentation is stopped at the end of 72 hours, so that the carbohydrate fraction is brought to a low level without digesting the protein. The gelatinous scum removed from the surface in commercial practice contains most of the ova-mucin and a large share of the glyco-proteins, so that the physical separation aids in the production of albumin of high purity.

Dried whites from fermentations in which Aerobacter and Escherichia types predominated yielded a bright, crystalline granular product. Batches from fermentations in which proteolytic bacteria, such as Proteus, Serratia, and Pseudomonas, persisted were dull, dingy and amorphous when dried.

Dried fermented egg white retained its original color at room temperature in the laboratory for four months. Dried unfermented egg white turned dark reddish brown.

Digest from "Bacteriological Studies on the 'Natural' Fermentation Process of Preparing Egg White for Drying," by L. S. Stuart and H. E. Goresline, *Journal of Bacteriology*, vol. 44, 541–49, November, 1942.

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BEVERAGES

Fine Wines

THE Niagara peninsula of Ontario offers the heavy clay soils and the requisite sunshine for growing the finest varieties of wine grapes. One of the best modern wine-making processes is the Charmat method, originally used in France. In the preparation and fermentation process the best Charmat practice is fundamentally the same as in pioneer wine making, with refinements of sanitation added. But chemical engineering has contributed much to the maturing, clarifying and bottling operations in the modernized Charmat process. In particular, special gas-tight apparatus has been designed for maintaining constant pressure while filtering, chilling and bottling. The wine's own gases, generated during fermentation, are made to supply the pressure. In this way the delicate esters and other factors which provide aroma and bouquet are conserved. Laboratory control is another vital feature since it permits accurate definition and control of quality factors such as the amount of added sugar and the extent to which this sugar is fermented in the finished wine.

Digest from "Fine Wines," by E. R. Haynes, *Canadian Chemistry and Process Industries*, vol. 26, 579–81, 1942 (Published in Canada).

FROZEN FOODS

Tenderness of Peas

THIS paper is an elaborately detailed report of investigations covering 1937-1939 operations in commercial production of frozen peas in Washington. The authors conclude that sieve sizing is unsatisfactory as a means of grading run-of-field samples into texture groups, since variations in the texture of fresh peas of different sieve sizes were less than the variations for one size taken from pods of different maturity, even when the variety, field and date of harvest were the same. For a given size the penetration value and tenderometer readings increased the longer the peas were left in the field. When skins of frozen peas were tough after boiling for

5 minutes, boiling for 15 minutes usually did not correct this condition.

Methods of handling the peas appeared to offer the best opportunities for improvement in texture and uniformity of product. Although vining consistently increased the crushing values of the cotyledons of frozen peas, and the skins were appreciably tougher than for the hand-picked samples, most of the toughening may be a result of delays between vining and freezing. The greater increase in toughness occurred during the first four to six hours of delay. Washing the vined peas in water, to remove vine juices, lessened but did not entirely prevent toughening due to delay before freezing. Cooling during delay periods also tended to retard the toughening. But six hours at 35 deg. F. or three hours at 75 deg. F. toughened the skins of the frozen peas as much as additional maturity indicated by an increase from 102 to 118 in tenderometer reading.

Digest from "Factors Influencing the Texture of Peas Preserved by Freezing," by M. M. Boggs, H. Campbell and C. D. Schwartze, *Food Research*, vol. 7, 272–87, July-August, 1942.

MISCELLANEOUS

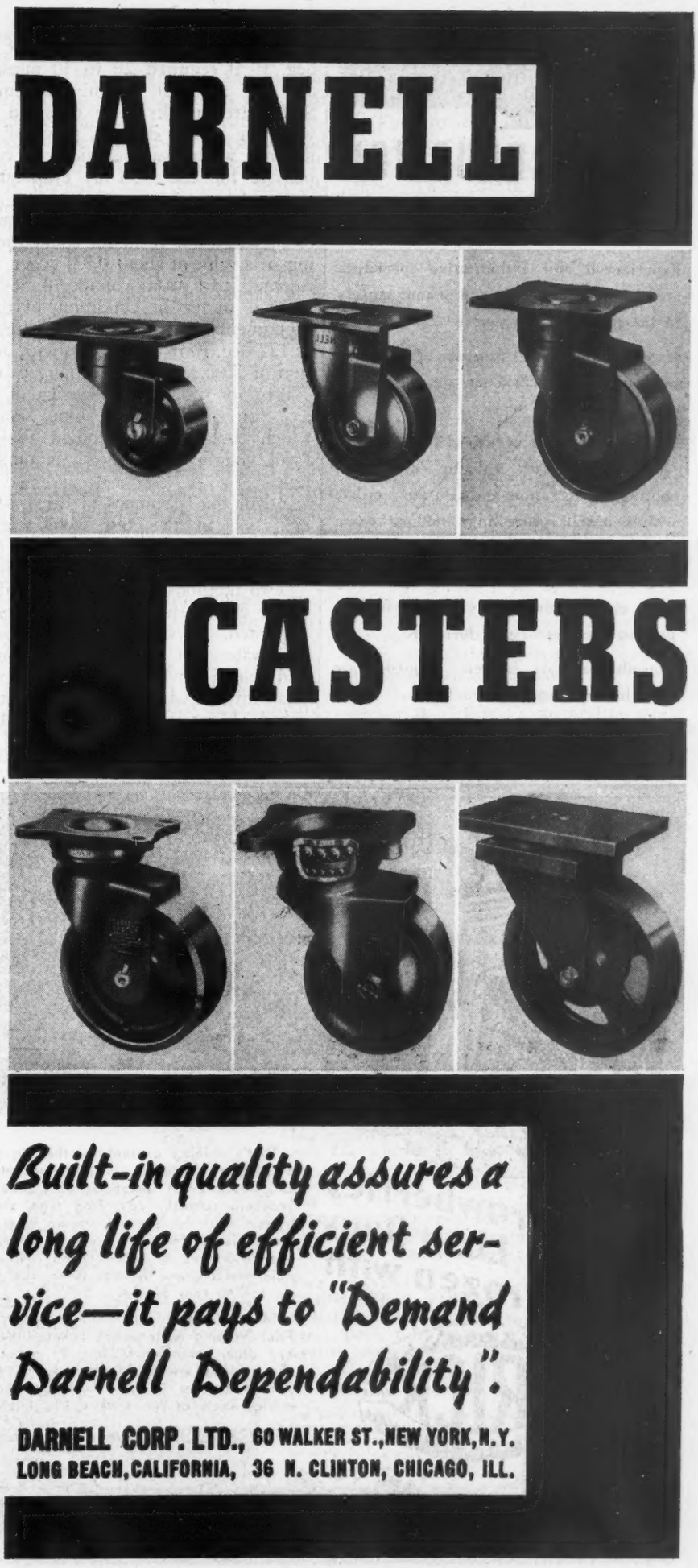
Whipping Properties Of Dried Whole Egg

THE authors have sought to develop practical methods of using dried whole eggs in normal baking practice. Sponge cakes were selected as a test of the baking quality of the dried-egg samples. The standard mixture contained 1¼ lb. of egg, 1 lb. of sugar, 1 lb. of flour and no secondary aerating agent. The egg and sugar were beaten 12 minutes in a Hobart-type mixer, then the flour was added. Quality was judged by a panel of experts. It was found that the flavor of the dried egg was not noticeable in the finished sponge goods, even when the baking quality was poor.

A correlation was established between the quality of the test cakes and the total volume of foam produced when a corresponding egg-sugar mixture was beaten.

For laboratory tests 75 c.c. of egg and 60 gm. of sugar were used, beating with a domestic mixer (Mixmaster) at 840 r.p.m. It was necessary to use separate samples for whipping and for baking tests, due to manipulative difficulties.

In the preliminary work, whipping tests were carried out at 70 to 75 deg. F., but later tests showed than an increase in temperature improved the foam volume and cake quality. When the egg and sugar mix was heated to 104 deg. F. and beaten with a mixer, arranged so that the humidity could be kept constant at 80 percent, maximum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foam volume was obtained with a 10-minute whipping period, while at 64 deg. F. it required 20 to 30 minutes and the resultant volume was small. Still better results were obtained by whipping at 120 deg. F., provided additional water was supplied to compensate for that lost by evaporation at this temperature.

There is an optimum specific gravity of the egg-sugar foam for sponge making, at a value of about 0.33, which corresponds to a foam volume of 380 to 400 c.c. under the conditions of these experiments. Egg-sugar foams obtained at 122 deg. F. in 10 minutes with addition of 20 c.c. extra water ranged from 370 to 580 c.c., with an average of 490 c.c. for ten samples. One sample, which could not be brought above a foam volume of 270 c.c., is omitted here.

All of the specimens of dried whole egg used in this test were selected because of their particularly poor whipping qualities at lower temperature.

Two methods of incorporating dried whole egg in sponge cake mixtures are suggested. A sirup made with sugar and water can be brought to boiling and poured slowly into dried egg powder reconstituted with water, beating at top speed. Flour is added when the foam has reached maximum volume. Or sugar, egg powder and salt can be blended, then boiling water added and the mixture whipped on a water bath. In either case the final temperature should be about 120 deg. F.

Digest from "Beating and Baking Properties of Dried Egg," by E. B. Bennion, J. R. Hawthorne and E. C. Bate-Smith; and "Influence of Temperature on the Beating and Baking Properties of Spray-dried Egg," by Hawthorne and Bennion, *Journal of the Society of Chemical Industry*, vol. 61, 31–34, February, 1942, and 151–53, October, 1942

Cold Storage of Apples

DISEASES of fruit in cold storage are probably due to unequal retarding of the physiological processes taking place in the fruit at the time of harvest. Respiration and oxidase and catalase activity of apples were used as indices to determine whether there is a period at which the various life processes are at a minimum, so that the fruit could be harvested and stored with less danger from storage disorders. The rate of respiration is important in that it determines the amount of heat generated by the fruit and must be taken into consideration in determining the amount of refrigeration necessary for properly storing or precooling the product.

No definite period of minimum activity was found.

Oxidase and catalase activity were not directly correlated with respiration or with each other. Oxidase activity decreased during the growing season, and showed no consistent increase when the fruit was left on the tree past the normal harvest season. Catalase activity increased throughout the period from July to November.

Respiration decreased during the early part of the growing season and reached a minimum prior to the commercial harvesting of the fruit.

Scald or soft scald did not occur in the apples used in these tests, but the respiration and enzymatic activity curves are so similar in varieties subject to these diseases and those that are not that it appears unlikely that susceptibility is due to differences in rate of respiration or in oxidase or catalase activity at harvest.

Digest from "Respiration and Oxidase and Catalase Activity of Apples in Relation to Maturity and Storage," by B. D. Ezell and F. Gerhardt, *Journal of Agricultural Research*, vol. 65, 453–71, November, 1942.

Correction

In the abstract of "Methods for Vitamin Control of Processed Foods," by B. L. Oser, FOOD INDUSTRIES, January, 1943, page 109, the recommended method for preformed vitamin A should have been given as the "antimony trichloride" method, instead of "mercuric chloride".—THE EDITOR.

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Where To Locate That Dehydration Plant

(*Continued from page 73*)

very difficult to store, with variable success. One company has reported that if the onions have not sprouted, and are dehydrated the very day they are removed from cold storage, a satisfactory product can be produced.

Losses Caused by Storing

Speaking of raw-material storage, here are a few bits of quantitative data that should have an important bearing on calculations as to a new plant. The longer a raw material is in storage the lower the yield of dehydrated food that can be produced from it.

Freshly harvested potatoes processed immediately are said to show a drying ratio of 8 to 1. After only a few weeks the moisture loss in storage changes the ratio to 7 to 1, but further storage results in an 8 or 8½ to 1 drying ratio because of the excessive trimming then required.

Onion deterioration is much more serious, the longer the storage the less the production. New onions promptly processed average about 10 to 1 in drying ratio, but at the end of a long season where stored onions are being dehydrated the ratio may increase to 15 to 1.

In certain areas where apples or prunes or raisins are commercially available, these can be fitted into a long operating schedule—provided the necessary apple peeling equipment can be found. As a rule, however, those who dehydrate apples have been in this business for a long time and are adding vegetables as a side line.

No small measure of the financial success of a dehydration enterprise is tied up in raw-material procurement, which becomes a possible or impossible job depending upon where the plant is located. This principle probably has had much to do with the early development of vegetable dehydration in California where, up to 1941, about 90 percent of the total national volume originated. The long, fertile San Joaquin Valley extending hundreds of miles north and south, with the Sacramento Valley extending still farther north, gave a production area of great elasticity, and plants located where these valleys could be drawn upon for raw materials were able to run for many months without notable interruptions. Those earlier California plants have set the pace. Newcomers must be able to compete with the long production runs or they cannot hope to survive longer than the current urgent need for processed foods at almost any price.

Fortunately, the prospective dehydrator can receive considerable help in his planning. All who contemplate entry into this form of food preservation are urged to confer at length with their respective agricultural experiment stations where truck-crop specialists and agronomists will be found most helpful.

A splendid table of crop materials (designated as Tables 1 and 1*b*) has been prepared by the Committee on Dehydration, U. S. Department of Agriculture, Western Regional Laboratory, Albany, Calif. This tabulation is huge, and will require many hours of study, yet it will repay the expenditure of time and effort.

Though adequate supplies of raw materials, sufficient for long runs, is the principal basis for choosing a location, there are many other factors for the dehydrator to study. But coveted high priority ratings are reserved for those who not only have a good raw-material location, but also have a good, or partial, supply of preparation equipment, as well as someone in the organization who understands the fundamental principles of dehydration and food technology.

When concentrating on the question of raw-material supply, one should not be so engrossed with this aspect of the jigsaw puzzle that he forgets the other important — nay, indispensable — features of a good plant location. These have been stated categorically at the outset of this discussion.

Common sense, aided by food technology, must prevail.

The problems introduced by prevailing temperatures and high humidities are to be the subject of another discussion. Their effects, though important, are not so difficult to compensate as the problems of raw-material procurement.

Army Specifications For Dehydrated Foods

(*Continued from page 71*)

tamate or other flavor-accentuating amino acid or acids. Not more than 25 percent by weight of salt. Not more than 32 percent, by weight, of dextrose, which percentage shall include necessary spices and coloring agents. (b) Shall be made the same as Type VIa, with the exception that the fat component shall be 25 percent hydrogenated vegetable oil.

Method of Inspection and Test

Inspection shall be made at point or origin unless otherwise specified. Moisture determination shall be made by the vacuum-oven method by heating 2 grams of the product at 70 deg. C. to constant weight (approximately 6 hours) in a partial vacuum having a pressure of 100 mm. or less of mercury.

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Packaging

Domestic—Unless otherwise specified, commercial packaging is acceptable under this specification.

Export—Types I, II, III, IV and V shall be packaged not less than 2 nor more than 4 lb. net as follows:

The product shall be packaged in a grease-and-moisture vapor-resistant bag, completely sealed by application of either heat or highly moisture-vapor-resistant adhesive on the bottom, and side seams. The closure of the bag shall be accomplished by means of heat, an adhesive that will impart no off-flavor to the product, or by folding over the mouth of the bag at least two full folds and taping down with 60-lb. gummed kraft tape or an equivalent tape which shall adhere to the bag. The tape shall be applied at right angles to the fold and at least two strips, one on each side of the bag, shall be used.

The stock of which the bag is manufactured shall be one of the following combinations:

(1) Two sheets of amber glassine, each of 25-lb. basis weight per ream (24"x36"x500) laminated with not less than 8 lb. of permanently plastic laminating agent per ream. The laminated glassine sheet shall be coated on each surface area with not less than 1½ lb. of a moisture-vapor-resistant thermoplastic coating material per ream (24"x36"x500). (2) A laminated film consisting of one sheet of not less than 0.0009-in. thick moisture-vapor-resistant heat-sealing regenerated cellulose laminated to either amber glassine of 25-lb. basis weight per ream (24"x36"x500) or hard-surfaced kraft paper of 25-lb. basis weight per ream (24"x36"x500), with 8 lb. of permanently plastic laminating agent per ream. (3) A laminated film consisting of two sheets, each of not less than 0.0009-in. thick moisture-vapor-resistant heat-sealing regenerated cellulose, laminated with not less than 3 lb. of permanently plastic laminating agent per thousand square feet.

The above bag shall be inserted into and sealed in a second bag constructed as a completely sealed envelope composed of minimum 40-lb. per ream (24"x36"x500) dense kraft paper, laminated with not less than 15 lb. of an asphaltic compound per ream, softening point minimum 155 deg. F., to a composition lead foil of not less than 0.00055-in. thickness, then laminated on the foil side to a sheet of moistureproof, anchored, coated, regenerated cellulose film not less than 0.0009-in. in thickness, coated on the outside with 2½ lb. per ream of a thermoplastic film sufficient to provide a face-to-face heat-sealed seam of adequate strength. The combined materials shall be securely laminated into one integral sheet. This material shall be formed into a flat envelope by application of heat to accomplish sealing along the side seams and at the bottom if necessary. The top seal may be accomplished by coating and application of heat. The inner bag shall be slightly oversize with respect to the outer bag, and the outer bag shall be slightly oversize with respect to the carton in which it is placed. The cartons in which the bags are placed shall be manufactured of kraft-lined bending chipboard 0.030-in. thick with a minimum Mullen bursting strength of 150 lb. per square inch of finished board. The kraft liner shall be not less than 0.006-in. thick and shall be on the outside of the carton. The board shall contain 25 percent corrugated cuttings in the filler. The board shall be sized, coated or otherwise treated so as to render it water-repellant. The carton shall be closed by application of a highly moisture-water-resistant adhesive.

In lieu of the package described in the above paragraphs, the products may be packaged as follows: The interlining bag may be formed of a waxed amber glassine sheet of not less than 25-lb. basis weight per ream (24"x36"x500) waxed with a refined paraffin wax to 30 lb. per ream (24"x36"x500). This bag shall be inserted in a carton manufactured of kraft-lined bending chipboard 0.030-in. thick with a minimum Mullen bursting strength of 150 lb. per square inch of finished board. The kraft liner shall be not less than 0.006-in. thick and shall be on the outside of the carton. The board shall contain 25 percent corrugated cuttings in the filler. This carton shall be double overwrapped with a waxed paper of 20-lb. basis weight per ream (24"x36"x480) waxed with fully refined paraffin wax to 30 lb. Type VI soup paste shall be packaged in hermetically sealed commercial tinned cans as may be specified in the invitation for bids.

If the first type of export package described is used, six each of the individual cartons shall be packed in an 0.080-in. thick solid fiber carton. This carton shall be closed with a water-resistant adhesive.

If the second type of export package described is used, six each of the individual cartons shall be placed in a bag of the same construction as that described and then placed in an 0.080-in. thick solid fiber carton.

Baked Beans

The following specifications form a part of the requirements for dehydrated baked beans:

Federal Specification JJJ-B-106—beans, dry.

Federal Specification SS-S-31—salt, table.

Federal Specification EE-S-631—spices, ground and whole.

Federal Specification JJJ-S-791—sugar, beet or cane.

Tentative U. S. Army Specification No. 22-42, "Supplies, Subsistence, for the United States Army, Conditions Governing the Purchase of."

U. S. Army Specification No. 100-2, "Standard Specifications for Marking Shipments."

Requirements

Beans used shall comply with Type A, Federal Specification JJJ-B-106. Salt used shall comply with Federal Specification SS-S-31. Spices used shall comply with Federal Specification EE-S-631. Sugar used shall comply with Federal Specification JJJ-S-791.

Fat used shall be hydrogenated vegetable shortening with an active free-oxygen-keeping test of 100 hours minimum and shall retain satisfactory flavor after heating to a temperature of 400 deg. F. The product shall be prepared and packaged in accordance with best commercial practice under strictly sanitary conditions.

Preprocessing

The beans, together with sugar, salt, fat, spices, and water shall be baked to full edibility without being mashed.

Dehydrating

The temperature and humidity of the air during dehydration shall be such that the product will not be scorched, casehardened or otherwise damaged. The liquid portion accruing from the baking of all the ingredients shall be dehydrated and included in the finished product.

Dehydrated Product

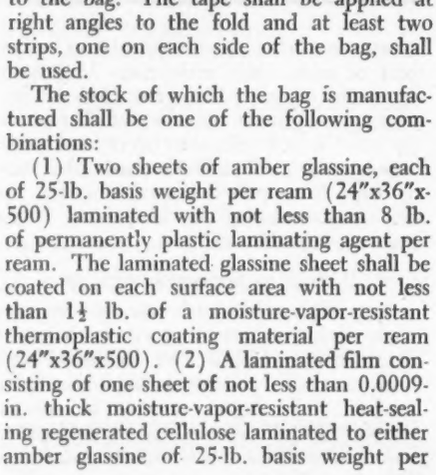
The dehydrated product shall possess a uniform characteristic brown color. The moisture content shall not exceed 6 percent by weight. Split beans and skins may be present as normally result from the baking and dehydration processes.

Rehydrated Product

Fifteen ounces of dehydrated baked beans shall rehydrate satisfactorily within 15 minutes when prepared according to directions on the label. The rehydrated product shall possess a uniform characteristic brown color, prominent baked bean flavor, and a tender but firm texture without excessive moisture.

Inspection and Test

Unless otherwise specified, inspection shall be made at point of origin. Chemical analyses, if required by the purchaser in the examination of testing of samples and deliveries under this specification, shall be made in accordance with methods of the



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Association of Official Agricultural Chemists in effect on date of invitation for bids. Awards will be made only after samples of the product and package have been approved by the Subsistence Research Laboratory, Chicago Quartermaster Depot.

Packaging

Dehydrated baked beans shall be packaged in completely sealed bags manufactured from one of the following materials:

(1) A laminated film consisting of one sheet with not less than 0.0009-in. thick moisture-vapor-resistant heat-sealing cellophane, laminated to either amber glassine of 25-lb. basis weight per ream (24"x36"x500) or a hard-surfaced kraft paper of 25-lb. basis weight per ream (24"x36"x500) with 8 lb. of permanently plastic laminating agent per ream.

(2) A laminated film consisting of two sheets, each of not less than 0.0009-in. thick moisture-vapor-resistant, heat-sealing cellophane, laminated with not less than 3 lb. of permanently plastic laminating agent per 1,000 sq. ft. These bags may be either flat or gusset style but shall be completely sealed by application of heat or moisture-vapor-resistant adhesives. In order to facilitate assembling in special rations, the bag shall be of such size that the required amount of product shall fill the bag approximately 75 percent. In addition to meeting the requirements of the Federal Food, Drug, and Cosmetic Act, and regulations promulgated thereunder, each package label shall furnish necessary directions for use. Unless otherwise specified, the product shall be delivered in standard commercial containers, so constructed as to insure acceptance by common or other carriers, for safe transportation, at the lowest rate, to the point of delivery. All cartons shall be stenciled or printed on one end as follows: Number of units, name of product, date of manufacture, contract number, name and address of manufacturer.

Tomato Juice Cocktail

The following specifications form a part of the requirements for dehydrated tomato juice:

Federal Specification SS-S-31—salt, table.

Federal Specification EE-S-631—spices, ground and whole.

Federal Specification JJJ-S-791—sugar, beet or cane.

Federal Specification HHH-T-576—tomatoes, fresh.

Federal Specification JJJ-T-581—tomato-puree, canned.

Tentative U. S. Army Specification No. 22-42. "Supplies Subsistence, for the United States Army, Conditions Governing the Purchase of."

U. S. Army Specification No. 100-2, "Standard Specifications for Marking Shipments."

Quartermaster Corps Tentative Specification, OQMG No. 12-A, "Packing for Overseas Shipments."

Tomato juice cocktail, dehydrated, shall be such of the following types as may be specified in the invitation for bids: Type I, flaked. Type II, powdered. It shall be of the grade indicated herein.

Dehydrated tomato juice cocktail shall be prepared from sound, fully mature, fresh tomatoes, of good red color, and/or grade A puree, sugar, salt, stabilizers, spices and seasonings. The sugar and salt shall be clean and of good quality. Stabilizers shall be clean, of good quality and free from any deleterious ingredients. Spices and seasonings shall be clean, sound, pure products, free from artificial coloring matter, adulterants, impurities, contamination and shall be of good flavor and pungency. All deliveries shall conform, in every respect to the provisions of the Federal Food, Drug and Cosmetic Act, and regulations promulgated thereunder, The product and the package shall be free from insect infestation.

Dehydrating

The temperature and humidity of the air during dehydration shall be such that the product will not be scorched or otherwise damaged.

Dehydrated Product

The dehydrated product shall possess a uniform characteristic color and a good, typical aroma, free from scorched, musty, rancid, bitter or other objectionable odors. The moisture content of the finished product shall not exceed 5 percent by weight. The dehydrated product shall be practically free from seed, skin and core, and shall contain not less than 75 percent by weight of tomato solids. The dehydrated product shall contain not more than 7 percent by weight of stabilizers, which may be pectin, gelatine, agar-agar, alginic acid or other officially recognized products.

Rehydrated Product

Dehydrated tomato juice cocktail shall rehydrate in water within five minutes, shall possess a good typical color, and a good tomato flavor.

Inspection and Tests

Unless otherwise specified, inspection shall be made at point of origin. Moisture determination shall be made by the vacuum-oven method by drying 2 grams of the product at 70 deg. C. to constant weight (approximately 6 hours) in partial vacuum having a pressure of not over 100 mm. mercury.

Packaging

Unless otherwise specified, dehydrated tomato juice cocktail shall be vacuum packaged in No. 10 hermetically sealed sanitary cans, 3 lb. to the can.

The sanitary cans shall conform to one of the following constructions: (1) Body of hot-dipped tinplate (107-lb. plate with 1.25-lb. tin coating per base box) with ends of chemically treated blackplate or electrolytic tinplate (107-lb. plate with not more than 0.5-lb. tin coating per base box), body seam to be soldered, top and bottom seams to be compounded or soldered, outer surfaces of the ends protected against corrosion by the application of a corrosion resistant coating of lacquer or enamel. (2) Body of electrolytic tinplate (107-lb. plate with not more than 0.5-lb. tin coating per base box) with ends of chemically treated steel, body seam to be soldered, top and bottom seams to be compounded or soldered, the ends enameled on both sides. (3) Body and ends of electrolytic tinplate (107-lb. plate with not more than 0.5-lb. tin coating per base box), body seam to be soldered, top and bottom seams to be compounded or soldered, all outer surfaces protected against corrosion by the application of corrosion resistant coating of lacquer or enamel. Unless otherwise specified, the label on each container shall be marked with the name and type of product, the net weight in pounds, the month and year of dehydration, name and address of packer, location of processing plant, and specific directions for rehydration.

Packing

Domestic—Unless otherwise specified, the product shall be delivered in standard commercial containers, so constructed as to insure acceptance by common or other carriers, for safe transportation, at the lowest rate, to the point of delivery.

Export—Unless otherwise specified, six No. 10 cans of the product shall be packed in nailed wooden, weatherproof solid fiber, or wire-bound wood boxes complying with Quartermaster Corps Tentative Specification OQMG No. 12-A.

Unless otherwise specified, shipping containers shall be marked with the name and type of product, the net weight of the product, the gross weight of and volume occupied by the container, the date of processing, the name of the contractor, the number of the contract or order, and date of packing. Ink used in marking containers shall take on wood or fiber and shall be water-fast and sunfast. Dehydrated tomato juice cocktail, when packed in nailed wooden shipping cases as described above, will have a gross weight of approximately 55.5 lb. and will displace approximately 2.41 cu. ft.

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FORMULAS FOR FOODS

FORMULA NO. 381

Pistachio Loaf

Cured pork trimmings (78–80% lean)	55 lb.
Cured boneless chucks	45 lb.
Dry milk solids*	8 lb.
White pepper	8 oz.
Pistachio nuts	4 lb.
Pimientos	6 lb.
Mapleine	1 oz.
Salt	1 lb.

* Not over 1½% fat

Directions

Grind pork through a ½-in. plate, and beef through an ⅜-in. plate. Place beef in silent cutter and chop fine. During chopping add dry milk solids, pepper, salt and Mapleine dissolved in 1 pint water; also put in enough shaved ice to make mass a little softer than for a frankfurter. After beef is cut fine, add pimientos and run just long enough to have about ½-in. pieces of pimientos showing throughout the mixture.

Put ground pork in mixer and add the chopped beef and pistachio nuts. Mix well.

Put mixture in molds lined with cured hog caul fat. Cook at 160 deg. F. for 3 to 4 hours, depending upon the size of molds. Inside temperature must be 154 deg. F. when taken out of cook.

Chill and take out of container. Stuff in cellulose casing.

Formula from American Dry Milk Institute, Inc.

FORMULA NO. 382

Virginia Peanut Cake

Cake flour	5 lb.
Baking powder	5 oz.
Salt	3 oz.
Sugar	6 lb.
Emulsified-type shortening	2 lb.
Peanut butter	2 lb.
High-grade molasses	1 lb.–4 oz.
Liquid milk	5 lb.
Whole eggs	3 lb.–4 oz.

Mixing Directions

Sift together the flour, baking powder and salt. Place all the ingredients except the eggs and 1½ lb. of milk in the machine bowl. Mix about 3 minutes on low speed followed by 2 minutes on second speed. Scrape sides of bowl frequently.

Mix the eggs and 1½ lb. of milk together thoroughly. Stream this in slowly during 2 minutes, mixing on low speed. Scrape down the bowl. Finish to a smooth batter by mixing 2 minutes more on second speed. The finished batter temperature should be 70 to 75 deg. F.

Baking

Scale 12½ oz. in 8-in. diameter layer pan. Grease pans with a mixture of 2 parts shortening and 1 part cake flour. Use paper bottom liners.

Bake 20 to 22 minutes at 365 to 375 deg. F. Allow the cakes to cool in the pans.

Formula from General Foods.

FORMULA NO. 383

Milk Sherbet Base

Skim milk powder	5 lb.
Granulated cane sugar	15 lb.
Corn sirup solids	15 lb.
Vegetable stabilizer	¼ lb.
Avenex	¼ lb.
Water	62¼ lb.
	100 lb.

Directions

Dissolve the skim milk powder in the water by introducing it gradually with constant agitation. Solution may be facilitated by mixing the skim milk powder with an equal quantity of sugar. Warm the mixture in a pasteurizing tank or similar receptacle. Combine the vegetable stabilizer and the Avenex with 5 lb. of cane sugar. Sift this dry mixture into the heated skim milk solution. Add the remainder of the cane sugar and corn sirup solids to the liquid mix and pasteurize the entire mixture at 145 deg. F. for 30 minutes. Cool to 45 deg. F.

Keep this basic milk sherbet mix in a storage tank until ready to freeze.

This can be used in making a variety of sherbets, such as Orange Milk Sherbet, Formula 384.

Formula from B. I. Masurovsky, consulting dairy chemist.

FORMULA NO. 384

Orange Milk Sherbet

Milk sherbet base (formula 383)	4½ gal.
Orange juice	24 oz.
Orange-peel extract	1 oz.
Orange color	3 oz.
Fruit acid (50% solution)	4 oz.

Directions

The orange juice, orange flavor and orange color are added to the basic sherbet mix before freezing. The fruit acid is introduced when the sherbet is half frozen.

The yield of finished frozen orange sherbet is approximately 6 gal.

Place the orange sherbet in standard 1-gal. or 2½-gal. ice cream containers and store in hardening cabinet or storage room until ready for use.

Formula from B. I. Masurovsky, consulting dairy chemist.

FORMULA NO. 385

Sour Milk Gingerbread

Shortening	14 oz.
Sugar	1 lb.–12 oz.
Whole eggs	13 oz.
Molasses	2 lb.–12 oz.
Cake flour	3 lb.– 8 oz.
Soda	1 oz.
Cinnamon	¾ oz.
Ginger	¾ oz.
Salt	1 oz.
Sour milk or buttermilk	2 lb.–12 oz.

Directions

Cream shortening partially, then add sugar and cream until light. Add whole eggs gradually, creaming until well incorporated. Next add molasses and mix well. Keep sides of bowl scraped clean.

Sift dry ingredients until well blended and add alternately with the sour milk or buttermilk.

Bake in squares, loaves or ovals. Bake at 340 to 360 deg. F.

Formula from General Mills, Inc.

FORMULA NO. 386

Sirup for Pickling Fruits

Various fruits, particularly figs and peaches, can be packed in a heavy vinegar sirup as fruit pickles. The fruit is prepared as for canning and cooked in sirup to about 60 percent sugar.

Sirup

Dry ginger root	12 oz.
Whole cloves	14 oz.
Stick cinnamon	18 oz.
Cider vinegar, 40 grain	3 gal.
Sugar	125 lb.
Water	20 gal.

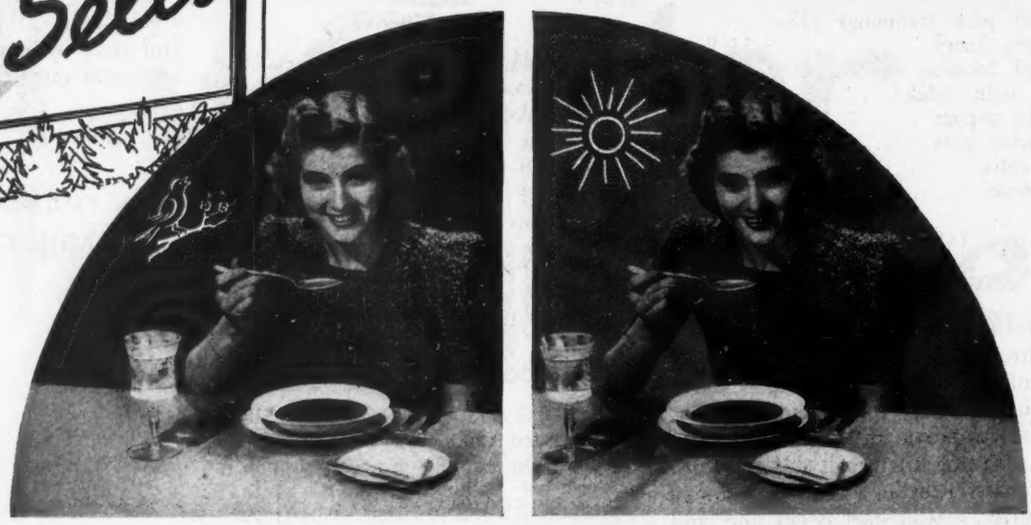
Directions

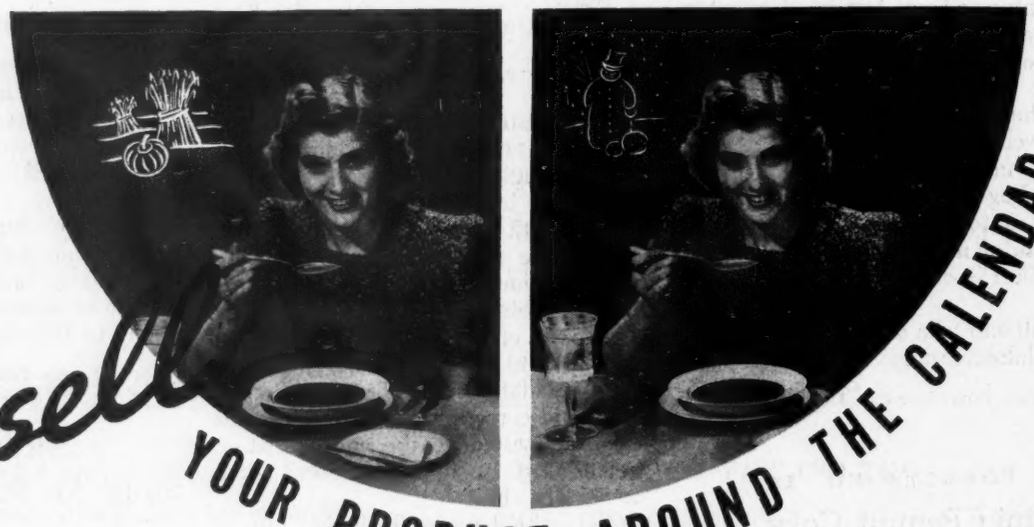
Place spices in cheesecloth bags. Cook fruit in sirup, then allow to stand overnight.

Remove spices. Pack in vacuum sealed jars and pasteurize 30 minutes at 175 to 180 deg. F.

Formula from "Utilization of California Fruits," by W. V. Cruess and G. L. Marsh, University of California Circular 349, October 1941, p. 40.

...but it takes CONTROLLED FLAVOR..





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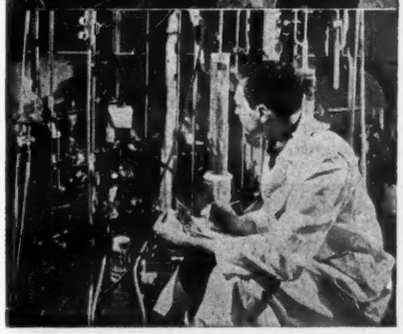

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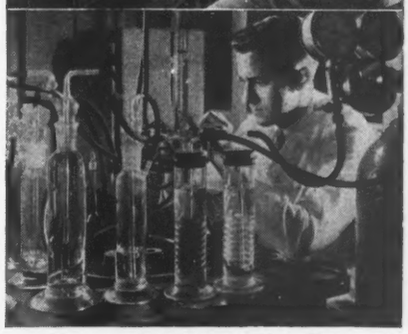

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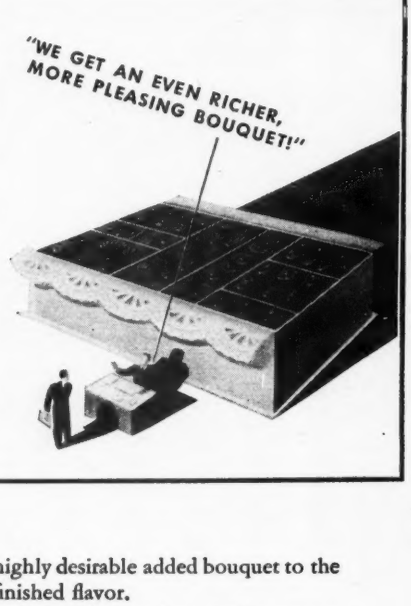

THERE is good reason for the swing to Ethavan. Food, confectionery and extract manufacturers alike are finding this high quality ethyl vanillin an excellent solution to wartime vanilla-flavoring shortages...and an excellent way to cut costs and improve the sales appeal of their products.

One large manufacturer reports that Ethavan gives him 3½ times the flavoring strength of vanillin in his formula . . . making it possible to increase production 50% with just half as much Ethavan as vanillin at a 33% reduction in flavoring cost!

You may or may not be able to equal those results in your product. Depending on the type of food product to be flavored, most users report that Ethavan has a relative flavoring strength three times that of vanillin. But even at lower ratios you will be able to increase your production per pound of flavoring material used and make substantial savings in cost.

You may also be able to improve your finished product! Fully equal to Vanillin Monsanto in uniform high quality, Ethavan has a pronounced and pleasing aroma which imparts a highly desirable added bouquet to the finished flavor.

Although supplies of Ethavan are definitely limited, raw material scarcities thus far have not affected this product as much as many others, and every effort consistent with the Victory program will be made to continue production at present levels. MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, St. Louis, Missouri. District Offices: New York, Chicago, Boston, Detroit, Charlotte, Birmingham, Los Angeles, San Francisco. Montreal.

ETHYL VANILLIN IN FEDERAL SPECIFICATIONS

Ethyl vanillin is now included in Army and Navy Specifications for imitation vanilla flavors. See "Federal Specifications EE-E-911a; Extracts, Flavoring; and Flavors, non-Alcoholic (September 22, 1941)" available from U. S. Government Printing Office, Washington, D. C.

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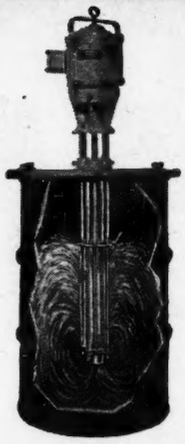
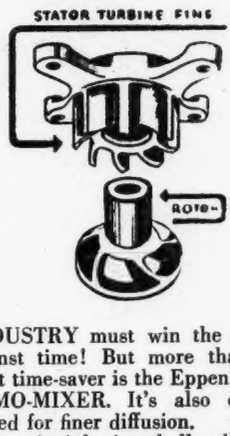
S-T-R-E-T-C-H Man Hours



WITH

HOMO-MIXER'S

ADVANCED PRINCIPLE



INDUSTRY must win the race against time! But more than a great time-saver is the Eppenbach HOMO-MIXER. It's also engineered for finer diffusion.

Its principle is wholly different. There is no vortex, no air to affect the mixture. Only a fraction of the mass is worked at one time, creating more uniform dispersion. The material is rapidly forced up from the air-free bottom by the stationary turbine fins. With tremendous pressure and turbulence, the flow surges upward, outward and down. The entire batch completes this cycle in just a minute or two. No clamping to tank, no setting at angle, no vibration.

HOMO-MIXERS are doing a big job in process plants today — batteries up to a hundred! Write us!

EPPENBACH

INCORPORATED

Processing Equipment for Over 30 Years

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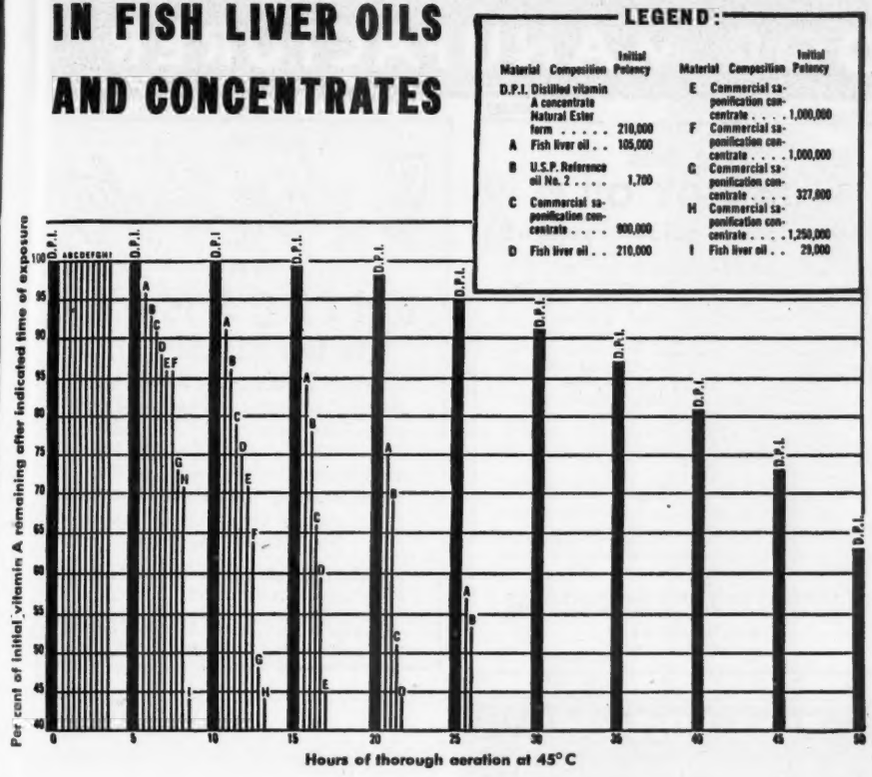
LONG ISLAND CITY, N. Y.

COMPARATIVE STABILITIES OF VITAMIN A IN FISH LIVER OILS AND CONCENTRATES


LEGEND:
Material | Composition | Initial Potency
D.P.I. | Distilled vitamin A concentrate Natural Ester form | 210,000
A | Fish liver oil | 105,000
B | U.S.P. Reference oil No. 2 | 1,700
C | Commercial saponification concentrate | 900,000
D | Fish liver oil | 210,000
E | Commercial saponification concentrate | 1,000,000
F | Commercial saponification concentrate | 1,000,000
G | Commercial saponification concentrate | 327,000
H | Commercial saponification concentrate | 1,250,000
I | Fish liver oil | 29,000
Per cent of initial vitamin A remaining after indicated time of exposure
Hours of thorough aeration at 45° C

The very significant chart above is the recent version of the chart first published in "The Story of Vitamin A Esters," 1939 edition. The marked difference between the Distilled Esters and other materials obtained on the open market has been confirmed; indeed the difference has become even more pronounced due to continued improvement in the production of Vitamin A Esters.

For a comparative test of stability (resistance to oxidation by heat and air), a sample of standard Distilled Vitamin A Ester concentrate together with representative samples of well known fish liver oils and vitamin A concentrates were subjected to an accelerated keeping test in our laboratories.

These vitamin A materials were first assayed to determine initial potency, then placed in especially designed reaction cells and subjected to thorough aeration at a temperature of 45° Centigrade (113° F.) for five hours at a time. At the end of each five-hour period the vitamin A potency of each concentrate was determined by the antimony trichloride reaction.

In this severe test the Distilled Vitamin A Ester concentrate was able to maintain almost 100% of original potency while all but four of the other materials suffered over 60% vitamin destruction. At the 20-hour mark, the Distilled Vitamin A Ester concentrate still assayed 97% of its original potency. The next concentrate assayed 51% and the two best fish liver oils tested 75% and 44% respectively. At the end of 30 hours, all other concentrates had suffered over 60% vitamin A destruction; yet Distilled Vitamin A Ester concentrate retained 92% of original A strength.

As this stability-test chart demonstrates, Distilled Vitamin A Ester concentrate is from two to ten times more resistant to the action of heat and air than the other representative vitamin A materials tested—a fact which in part explains the strikingly increased demand by food processors for our Distilled Vitamin A.

And remember—Distilled Vitamin A in the natural Ester form is *bland*. It does not impart flavor or odor to the most delicate foods. It is *continuously available*, and in scientifically *uniform quality*. Potency specifications are met precisely to your order.

Get the facts about this superior Vitamin A concentrate. Write for "The Story of Vitamin A Esters," new, completely revised edition.

● Here is evidence of the superior stability of DPI Vitamin A Esters*, the potent concentrate of vitamin A produced by high vacuum molecular distillation. Get all the facts—today.

*Protected by U.S. product patent No. 2,205,925 and more than 50 process patents

DISTILLATION PRODUCTS, INC.

755 RIDGE ROAD WEST, ROCHESTER, NEW YORK

Jointly owned by EASTMAN KODAK CO. and GENERAL MILLS, INC.

Sales Agent:

Special Commodities Division, General Mills, Inc., Minneapolis, Minn.

"Oil-Soluble-Vitamin Headquarters"

MATERIALS
FOR THE FOOD MANUFACTURER

The *NATURAL* B Complex
WHEAT GERM
CORN GERM

Defatted, dehydrated, perfectly stable. Richer in B complex than original embryo. Rich sources protein of high biologic value. Among richest foods known in B complex and protein and mineral values, yet perfectly stable. Ideal materials to fortify cereals, drinks, candy, etc.

VioBin WHEAT GERM OIL

perfectly stable; requires no refrigeration; tocopherol content 3.5 to 4 milligrams per gram.

VIOBIN CORPORATION
36 Oak St. Monticello, Ill.
VioBin (Canada) Ltd., 637 Craig St., West, Montreal, Quebec

Why does CARROT OIL make foods golden yellow?

Because carrot oil contains carotene. Carrot oil is extracted from carrots, and each pound contains up to 25 million units of carotene, the international standard of vitamin A.

Carrot oil is preferred for vitaminizing foods because it is a natural vegetable oil, and because it contributes vitamin A of high stability and desirable golden yellow color.

Carrot oil is not synthetic, does not contain animal fats of any kind, and does not produce fishy flavor.

Also producers of ThiaBee, a stabilized wheat germ products rich in Vitamin B_1.

These vitamin products are of particular interest to all manufacturers of food products.

Inquiries are invited. Literature, prices and samples to firms requesting same on their letter heads.

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NEW ADVERTISEMENTS
must be received by February 18th to appear in the March issue.
Address copy to
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go further
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These fine spice flavors can be used with considerable advantage—not only in replacing completely the dry spices you may now be using—but also to extend your present spice supplies.

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EXPANDS AS IT SETS

One formula for all uses—corrects imperfections in threads—smooths flange faces—expands and contracts with pipe movement—withstands pressure—holds anything carried in metal pipe except some heavy acids—economical, goes four to six times further than ordinary compounds—ends leaks permanently in all types of lines.

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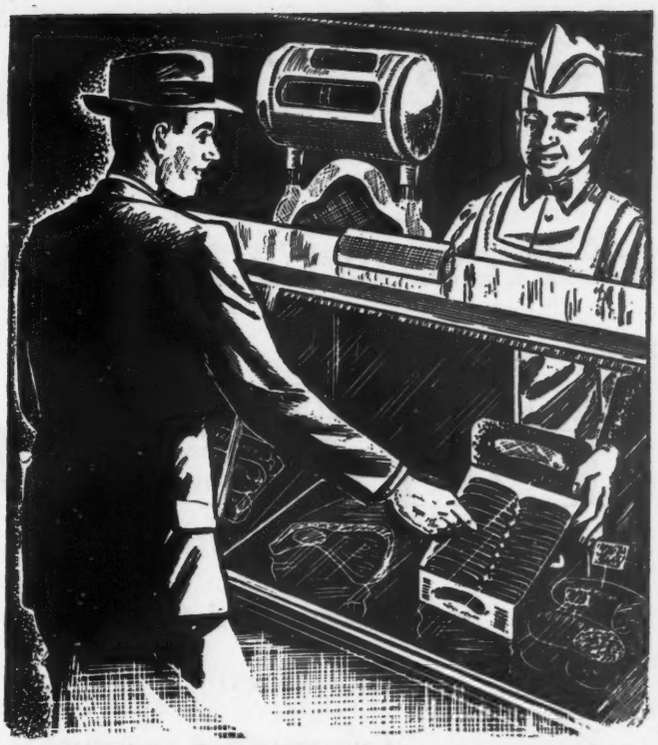

FIRST CLUE TO FLAVOR *IS COLOR*

Only color can seize the hurried shopper's eye and invite him to try how really good your food tastes. Exactly the right color makes the sale. Exactly the right color — uniformly repeated — makes a steady customer.

National, pioneer domestic producer of U. S. Government Certified Food Colors, makes the most complete line of Primary Colors and Blends. With its 35 years experience in helping food manufacturers meet every requirement of shade, strength and uniformity, National Certified Food Colors merit your careful consideration.

We invite you to use National Technical Service for color matches, formulas or other helpful data.

Certified Food Color Division

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ALLIED CHEMICAL & DYE CORPORATION

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Uniform Potency

Proteolytic and diastatic enzymes—prepared by this established pharmaceutical manufacturer with all the scientific care bestowed on prescription products for physicians—are now available to members of the food industries. Careful standardization of their high potency gives you a tool of assured results. And, in addition, Stearns is prepared to make available to interested manufacturers the facilities of its fine laboratories to solve special problems. *Inquiries are invited. Please address your inquiries to the Enzyme Department.*

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Our Organization is prepared to—

Design, Construct and Equip Complete New Plants or Specify and Install Dehydration Units in Existing Plants for the DEHYDRATION OF FRUITS, VEGETABLES, MEATS AND OTHER FOODS.

These activities are under the personal supervision of one of the country's foremost Food Technologists (long a leader in the development of Dehydration).

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Refrigeration should be considered as an adjunct to the Dehydration Industry, and we are prepared to make complete investigations and recommendations regarding DEHYDRATING with reference to:

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- Selection of the BEST PROCESS
- Development of the most efficient EQUIPMENT and PLANT LAYOUT
- Proper STORAGE and PROTECTIVE PACKAGING

—ALL IN RELATION TO THE REQUIRED INVESTMENT AND EARNING CAPACITY.

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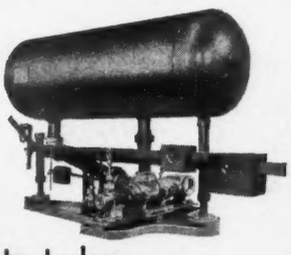
Save fuel—increase production

Investigate today so you can raise your output and lower your fuel costs tomorrow.

Users claim substantial increased production with

13 to 27%

savings in fuel by using ACKER Systems of Steam Drainage, Deaerating and Boiler Feeding. Write for data today.



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Sharp-cut Cutters

Rapid Simple Safe

Swift, free-action cutting—large capacity at low cost . . . Masterbuilt, close regulation—safe for all use. . . . Perfect results cutting herbs, spices, drugs, roots, stems, hulls, beans, peas, grain, cork, copra, dry pulp, charcoal, paper, etc. . . . Made in several sizes.

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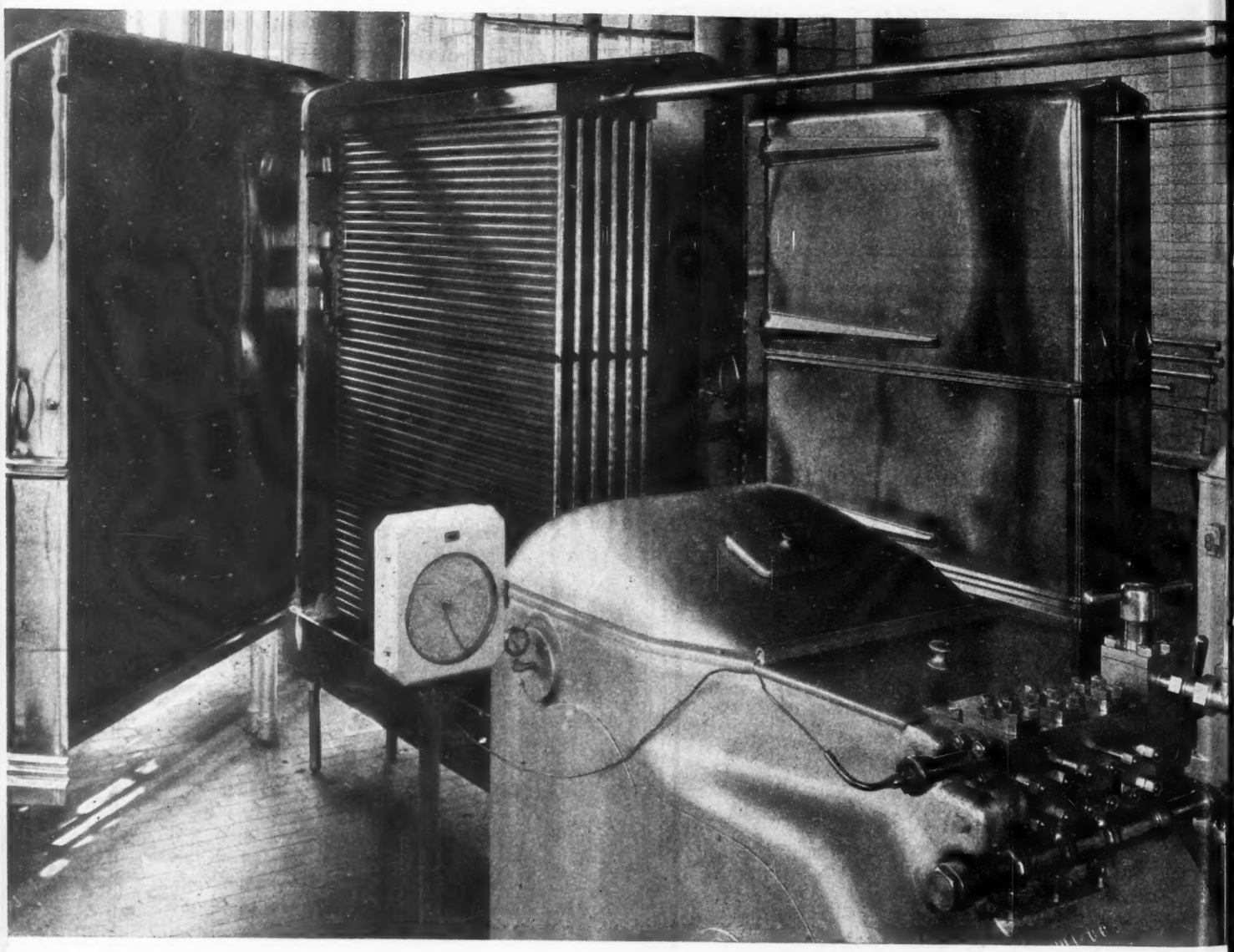
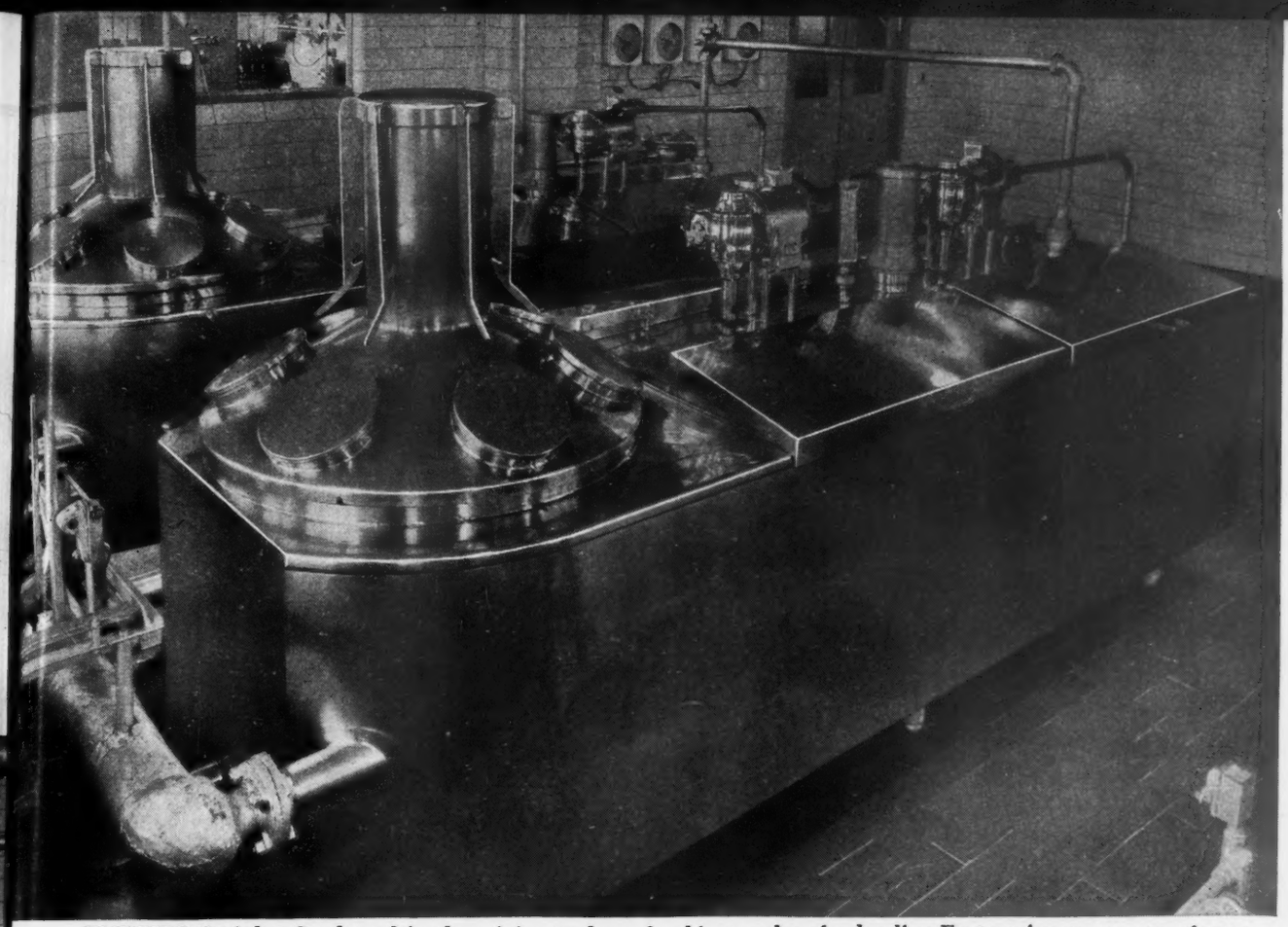
Help ENDURO

Win the Food Battle on the Home Front!



REPUBLIC *Enduro*

Other Republic products include Ex-L-ite Tin Plate, Pipe, Sheets,



ENDURO Stainless Steel used in the mixing tanks and cabinet cooler of a leading Eastern ice cream manufacturer.

Do you have equipment of Republic ENDURO* Stainless Steel? Then use its advantages to the limit in helping to win the food battle on the home front.

ENDURO can save you time—vital man-hours—in cleaning. It can save valuable minutes between batches—can increase production availability of equipment—can boost potential output of processed foods.

The hard, smooth surface of this wonder-working metal seldom requires more than flushing with water and wiping. When scrubbing is necessary to remove greases or sticky substances, ordinary cleaning compounds do not harm its sanitary surface. (See the ENDURO Conservation Card for detailed information on cleaning.)

ENDURO is inert to fruit, vegetable and meat juices—does not contaminate—does not alter flavor, color, composition or purity. It's tough and strong—lasts indefinitely with proper care—rarely requires repair or maintenance that might cause production-delaying shut-downs—reduces maintenance cost.

Your ENDURO equipment can be more valuable today than ever before. Put it to work—to help win the food battle on the home front. New equipment is difficult to obtain—but if you can qualify with a high priority, we're ready to supply the stainless steel needed for approved essential applications.

*Reg. U. S. Pat. Off.

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ARE YOU USING YOUR CONSERVATION CARDS?

We have distributed thousands of poster-size wall cards giving detailed information on cleaning ENDURO and suggestions for lengthening the service life. Are yours posted in a prominent location? Do you need new cards? Write us.

REPUBLIC STEEL
PRODUCTION FOR VICTORY

STAINLESS STEEL

Bolts, Nuts, Rivets, Electrunite* Condenser and Heat Exchanger Tubes.

IF IT'S

HEAT RESISTANCE

YOU WANT

Thermometer wells, pipe lines and other vital processsing equipment withstands corrosion and high heat, and has a *longer service life*—thanks to Carpenter Welded Stainless Tubing.

The *uniform wall thickness* of this tubing means that there are no thin spots to "burn out" first. And it is ductile, easy to fabricate — thus helping to speed the production of vital wartime equipment that must win battles against excessive heat. Then too, tubes are *natural design units.* Parts can often be finish-formed by merely swaging, tapering, expanding, etc. If you have a wartime heat resistance problem that must be solved right now, take advantage of Carpenter's diversified experience in many plants where similar problems have been met and solved.

FOR HELP in applying Welded Stainless Tubing, ask for our series of "Quick Facts" bulletins. They contain practical working information to help you with new design or fabricating problems. A note on your company letterhead will start a set of "Quick Facts" bulletins on the way to your desk.

CARPENTER WELDED STAINLESS TUBING
resists corrosion, heat and wear; is 100% hydrostatically tested.

THE CARPENTER STEEL COMPANY
Welded Alloy Tube Division • Kenilworth, N. J.

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WELDED
STAINLESS TUBING

DAMROW

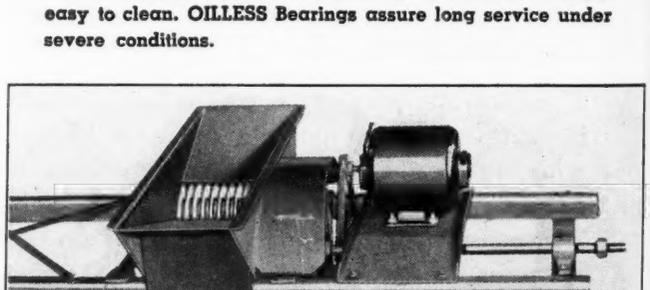
SLICERS
SHREDDERS
BLENDERS for

FOOD *dehydration*

DAMROW Slicing, Shredding, Blending equipment is "performance proven" in a wide variety of applications. Carefully engineered to the job YOU want done, it is adaptable to many essential operations in the pre-handling of all types of food for Dehydration. It is specially designed for high capacity work, and for uniform, carefully measured cuts without pressing, forcing or squeezing—offering a greater measure of protection to food products. Both the size of cut and cutting speed can be adjusted to fit your production line and the food to be processed. Special models can be built for either batch or conveyor work, for portable or "on the line" use.

DAMROW PORTABLE CUBER for PILOT DEHYDRATION UNITS

Good capacity, uniform cutting. Easy to handle. Sanitary, easy to clean. OILLESS Bearings assure long service under severe conditions.



WRITE FOR DETAILS ***on specially designed Damrow Complete Food Dehydration Equipment:***

★ ★ ★

- **Damrow Food Dehydrators**
- **Damrow Complete Equipment for slicing, shredding, grinding and blending.**
- **Damrow Blanching Tanks, Vats, Cookers**
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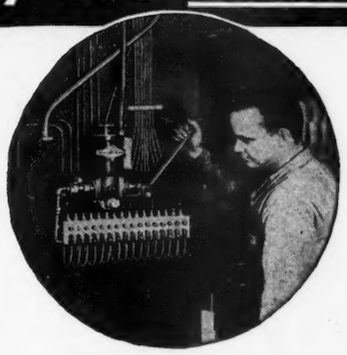


LINCOLN CENTRO-MATIC LUBRICATING SYSTEM

lubricates all bearings from a single source

CUT production delays and lower your lubrication and maintenance costs by equipping your machines with Lincoln CENTRO-MATIC Lubricating Systems.

These modern lubricating systems are easily installed on new or old machines. They make it possible for *all* bearings on a machine to be lubricated from a single source, and machines can be run day and night without taking time-out for lubrication service.

A Centro-Matic System is a centralized system consisting of a number of Centro-Matic injectors—one for each bearing—and a suitable Lincoln pump for delivering the lubricant under pressure to the injectors.

The injectors may be grouped at one location or mounted separately at each bearing. In either arrangement only a single lubricant supply line is required.

The lubricant pump may be hand or power operated. Power operated systems may be semi-automatic or full-automatic.

In an installation of the type illustrated above, a man can stand beside a machine, pull a lever back and forth a few times, and a predetermined amount of lubricant will be delivered through a centralized system to each bearing on the machine. *Write for Bulletin No. 888.*

ARMY E NAVY

ARMY-NAVY PRODUCTION AWARD for high achievement in the production of war equipment has been conferred upon the Lincoln Engineering Company. It serves as inspiration toward greater and greater accomplishment until the time of final and complete Victory.

142-21A

LINCOLN ENGINEERING COMPANY
PIONEER BUILDERS OF LUBRICATING EQUIPMENT
ST. LOUIS, MO.

Insulation for COLD from a Man-Made Volcano!

ACCORDING TO LEGEND, the first mineral wool was produced during an eruption of the volcano Kilauea in Hawaii. Geological survey revealed this substance to be lava, blown into soft threads by the gigantic forces of the volcano.

Today, at Johns-Manville factories, in man-made volcanoes, molten silica minerals are blown by means of steam into silky fibers. These mineral fibers are formed into Rock Cork, which is exceptionally efficient for low-temperature insulation. Rock Cork is immune to termites, vermin and mold. It can't rot, does not absorb odors.

Mineral wool is one of four basic materials from which all Johns-Manville products stem: Asbestos, asphalt, diatomaceous earth and mineral wool. Today, Johns-Manville has but one aim: To make these products in the quantities needed to help win the war. Johns-Manville, 22 East 40th Street, New York, N. Y.

JM PRODUCTS

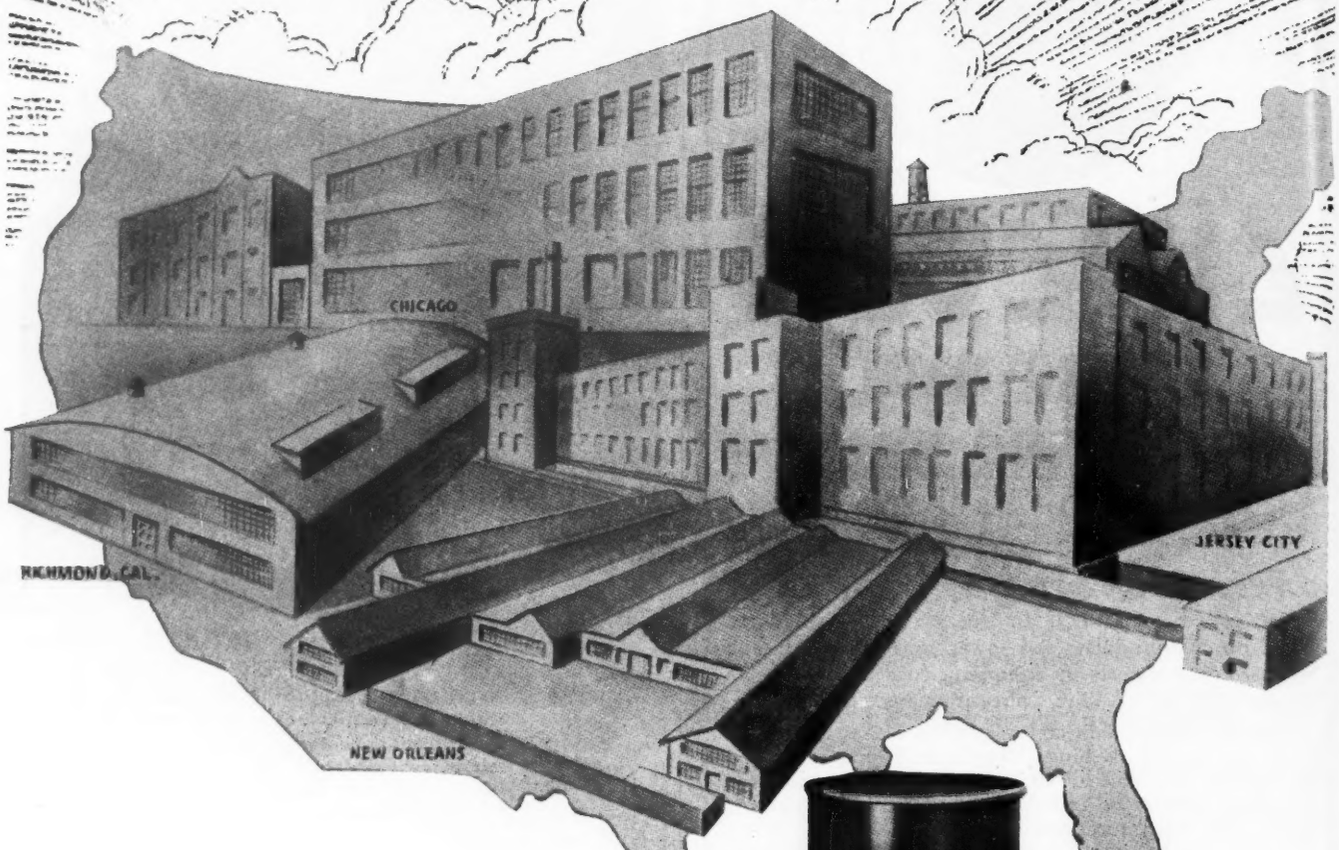
Johns-Manville ROCK CORK

A New Name

INLAND STEEL-CONTAINER CO.

formerly

WILSON and BENNETT MFG. COMPANY



Operating under the same management installed by the Inland Steel Company several years ago.

INLAND STEEL CONTAINER CO.

Formerly WILSON & BENNETT MANUFACTURING COMPANY

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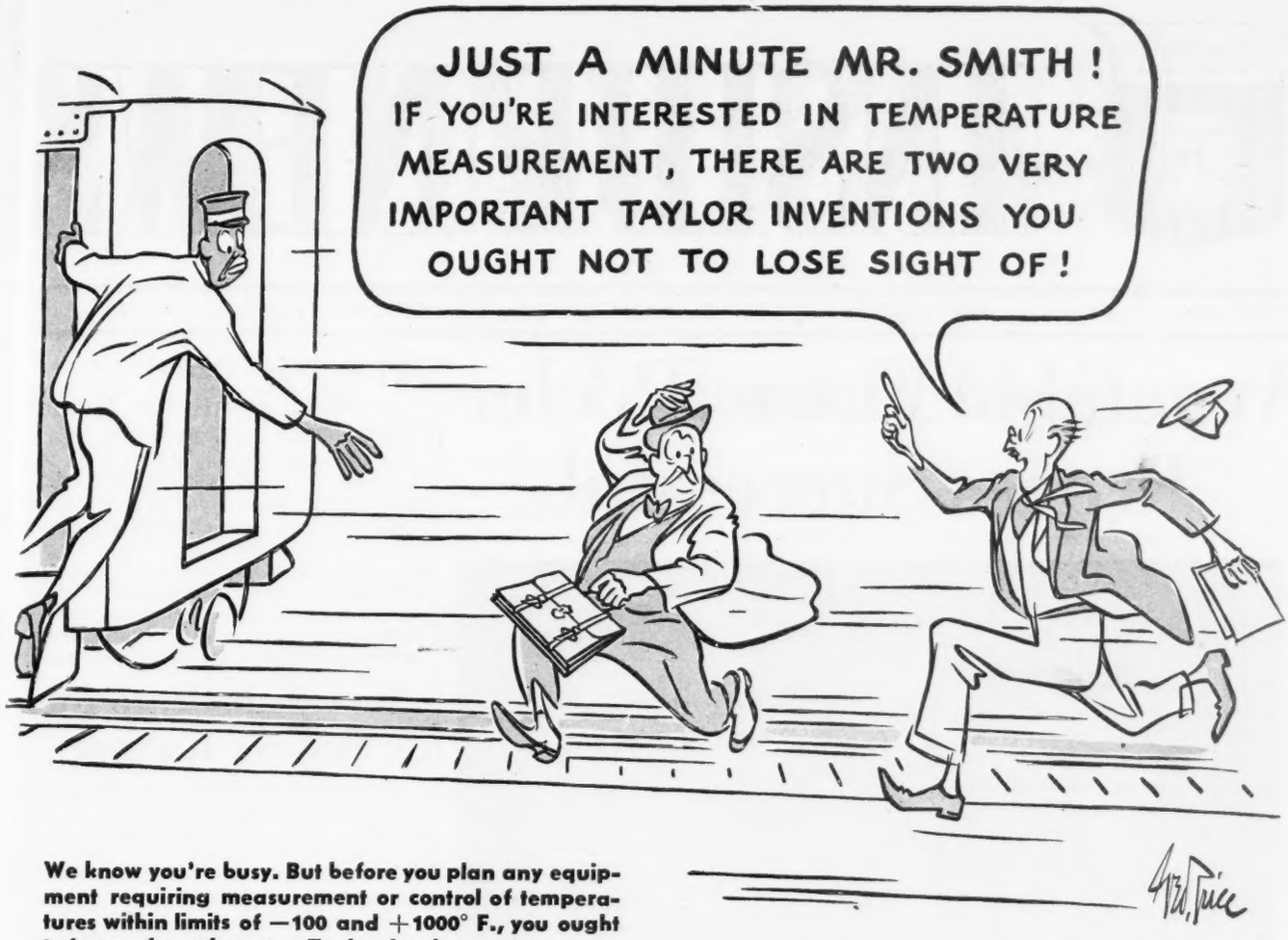
Plants at Chicago—Jersey City— New Orleans—Richmond, Calif.

Sales offices in all principal cities

CONTAINER SPECIALISTS


JUST A MINUTE MR. SMITH!
IF YOU'RE INTERESTED IN TEMPERATURE MEASUREMENT, THERE ARE TWO VERY IMPORTANT TAYLOR INVENTIONS YOU OUGHT NOT TO LOSE SIGHT OF!

We know you're busy. But before you plan any equipment requiring measurement or control of temperatures within limits of —100 and +1000° F., you ought to know about these two Taylor developments:

1. Mercury tubing that can't tell a lie! Imagine being able to have all the advantages of a mercury-actuated recording thermometer—on an application requiring long lengths of connecting tubing! It's long been an established fact with Taylor Accuratus Tubing. This precision-bore tubing, a Taylor invention, has a special alloy wire inside, with a coefficient of expansion so related to the tubing and the mercury that any variations in ambient temperatures along the way are counteracted on the spot. The result is *accurate* temperature recordings.

2. Accurate temperatures several times faster! Where a separable well is required to protect the temperature-sensitive bulb from erosion or corrosion (or to permit removal of the bulb without disturbing the contents of the equipment) there always used to be a considerable time lag in transmitting temperature changes to the bulb. But that was before Taylor "Thermospeed" came along. With Taylor Thermospeed Separable Well construction, response is several times faster than the average separable well tube system, with minimum bulb conduction error.

CALL YOUR TAYLOR FIELD ENGINEER. These are only two of the many "plus-values" which have given Taylor its reputation for leadership in the temperature field. If you need indicating, recording or controlling temperature instruments, your Taylor Field Engineer will determine whether a mercury, vapor or gas-actuated system is best for your particular requirements. And from a wide variety of bulb and well constructions and connecting tubings at his command, he will specify the other details which assure the accuracy, responsiveness, and long life characteristic of Taylor Instruments. Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada. *Instruments for indicating, recording, and controlling temperature, pressure, flow, humidity, and liquid level.*

Taylor Instruments
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ACCURACY FIRST
IN HOME AND INDUSTRY

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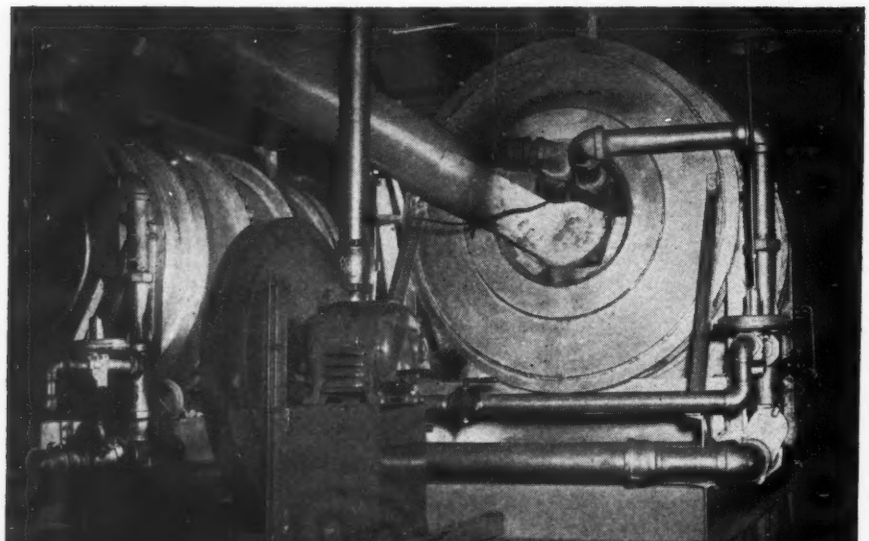
INSIDE NEWS

FEBRUARY PREPARED BY NATIONAL CAN CORPORATION, NEW YORK, N. Y. 1943

Vegetable Flame Peeler Proves Successful



FLAME PEELER IN USE—*More satisfactory than abrasive peelers which remove a much higher percentage of the good part of vegetables, the flame peeler may well become a standard piece of cannery equipment in normal times.*

A FLAME PEELER has been used by a New York canning company to prepare vegetables for newly installed dehydrating lines. So successful has been the operation that it may prove a satisfactory unit for use in canning operations as well as for dehydrating.

The peelers originally were designed for use on pimentos in the south. They have been tried experimentally on carrots and should prove satisfactory for similar root crops.

The peeler consists of a large rotating metal cylinder lined with a refractory brick worm which carries the product through the cylinder during the flame treatment. An intense flame is blown into the cylinder through the intake end. As the vegetable passes through the outer surface is charred. A forceful stream of water at the output end of the machine washes off all the charred peel and the vegetable is ready for the inspection and preparation line.

The advantages of the flame peeler are said to be fast production with a minimum waste of material, since there is no abrasion beyond that of the water spray which cannot penetrate deeper than the heat treatment. (269)

Brazilian Oils Gain New Importance

Besides producing cottonseed, linseed, castor, coconut, brazil-nut, sunflower, peanut and palm kernel oils, as well as oil from coffee, Brazil yields many other vegetable oils which may become important as a result of war shortages. They include citicia oil from the seed of that name; babacu oil from babacu nut; andiroba oil, similar to almond oil; curicuri oil, similar to copra oil; bankul oil from the nogueira nut; cumarin oil; the edible oils of curua, sesame and macauba; pracaxi oil; corn oil and mustard oil. Moreover, murumuru and tacum, two vegetable fats used in the manufacture of margarine, are also produced in Brazil. (270)

* * * * *

SYNTHETIC TALL OIL has reportedly been produced in India from rosin and fatty acids by a method worked out at the Forest Research Institute, Dehra Dun. This material is in demand for the production of asphalt emulsions for road making, the British press reports.

Paints Now Made With Synthetic Resins

Paints made with synthetic alkyd resins have durability and adaptability. In the new lusterless, olive-drab enamels, these resins have largely replaced tung and perilla, and their incorporation in other paints has produced coatings particularly valuable for protecting the superstructure and other parts of warships. One report asserts that these resins and heat-bodied linseed oil yield varnishes better in some cases than those produced with tung—and at a smaller cost. (271)

New Substitute for Sponge Rubber

Because a kettle boiled over accidentally, a surgical dressings manufacturer has announced, there is a new substitute for sponge rubber that can be produced from waste farm products and used in tanks, airplanes and other war equipment.

Two chemists in the laboratories of the company were seeking a substitute for rubber as an adhesive in adhesive tape. They combined a resin with an acid. When they attempted to vulcanize it in a kettle with other chemicals, the contents foamed up out of control. They succeeded in controlling the foam and the new rubber substitute was the result. The sponge-rubber substitute, as yet unnamed, can be used to line tanks, pad airplane cockpits, pad helmets, fill seat cushions and make de-icers for airplane wings and mattresses for hospitals.

After the war the product will be used for general civilian production to replace natural sponge rubber. The discoverers of the new product said the resin was derived from soybean and corn oil. They said that by controlling the foam they can control the density and resilience of the substitute rubber. It is also claimed that the product absorbs more water than spongy rubber and can be easily vulcanized to metals, plastics or wood. Moreover, it does not age as rapidly as natural rubber and resists acids and gasoline better. (272)

War Spurs Meat-Drying Techniques

Probably one of the most important developments to come out of the war, so far as the other Americas are concerned, is the advance in knowledge of drying meats. The U. S. Government is placing large orders for millions of pounds of dried beef and pork.

Dried beef is made from the lean portions of beef cattle, with bones and fat removed. An average steer will produce about 75 pounds of dried beef weighing only one fourth as much as the original meat and measuring only one half the volume. Equally important, the dried beef can be safely eaten months after it has been prepared. (273)

NATIONAL CAN

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Importation of Mexican beer into the United States has more than tripled since last year. The leading breweries declare that they can supply only half of the present U. S. demand. Mexican beer also goes to several Latin-American countries.

* * * * *

Promote Sauerkraut Canning in the Home

Owing to restrictions placed upon canning sauerkraut in tin cans, manufacturers of kraut may stimulate the sales of bulk kraut by promoting its purchase for home canning in addition to that used for immediate consumption.

The objection to enforced selling of kraut in bulk is that it does not keep the year around. Continued fermentation in the containers after it is in the retailer's establishment eventually makes the kraut unedible. It is unlikely, therefore, that bulk consumption can ever result in as large a total demand as existed when the product could be canned.

However, a real consumer education campaign, sponsored by the kraut packers, might well point out to the housewife the advantages of purchasing new kraut in bulk and packing it at home for future consumption. Such promotion could give specific directions for home-canning of kraut, either by the hot-pack or cold-pack method.

Home-canning of kraut is easy. The only disagreeable home chore would be making the kraut in the first place. (274)

WARTIME CONTAINERS—National Can Corporation is producing quantities of steel drums and kits to contain essential war supplies. The type of steel drum shown here carries high-grade lubricating oil and solvents for the U. S. armed forces, has a capacity of 5 imperial gallons.

Technical Topics

VEGETABLE "BRICKS"—The compression of dehydrated vegetables into "bricks" which can be coated with various packaging materials to replace critical metals is being studied by the New York State Agricultural Experiment Station at Geneva, N. Y. The dried vegetables are reduced under tremendous pressure to small "bricks" practically free from air. They are then coated with various moisture-proof and gas-proof materials. (275)

NETTLES—Britain's search for economic value in weeds has developed a paper of excellent quality from nettles. (276)

PHOSPHATE COMPOUNDS occupy an important role in the manufacture of bread for the American armed forces. Ammonium phosphate is used as a propagating agent for yeast going into the dough, and sodium ferric pyrophosphate is added to the dough batch to aid the nutritive qualities of the flour. (277)

GELATINE can be made from dried rabbit skin shreds, and a patent covering the method has recently been issued. (278)

FLAVORINGS—Allied occupation of Reunion Island in the North African campaign gives this country another source of flavoring ingredients. Vanilla beans are produced on that island—also vetiver, ylang ylang and geranium. (279)

CHLORINE added in very small amounts to the circulating water of steam condensers was successful in preventing organic growths in the tubes. It is reported that the treatment is now in use in many British power stations. (280)

HALOGENATED POLYTHENES, described in a recent British patent, are declared to be useful raw materials for the manufacture of paints, varnishes, artificial leathers and related products. The polythene to be halogenated is made by polymerizing ethylene by subjecting it to very high pressure and moderately high temperature. (281)

AMMONIA SUBSTITUTES — Replacements for household ammonia, now unavailable because of the war, have been introduced by a number of manufacturers. The new products are said to clean everything that ammonia will clean, while offering the additional advantages of improved odor and lower toxicity. (282)

INSECTICIDE—A possible substitute for rotenone, essential insecticide ingredient now practically unavailable, exists in the ground seeds of the yam bean, a tuber-like root grown in some Central and South American countries. Tests against cabbage worms, codling moth larvae, aphis, etc. showed results in some cases equal to the control provided by rotenone. (283)

TERPHENYLS have been made available commercially by a large American chemical manufacturer. The new high molecular weight, aromatic compounds are declared to offer opportunities in the chemical synthesis of dyes, drugs, and organic chemicals. They may be halogenated, sulphonated, or nitrated in the manner usual for aromatic compounds, it is added. Ortho, meta, and para forms are offered. (284)

PLANT HORMONES—Phenoxy and benzoic acids substituted in the nucleus with halogen, methyl, and nitro groups were declared recently to have opened a new line of progress in plant hormone development. Dichlorophenoxyacetic acid is very effective, it was stated, in causing cell elongation, adventitious roots, parthenocarpy and various formative effects. (285)

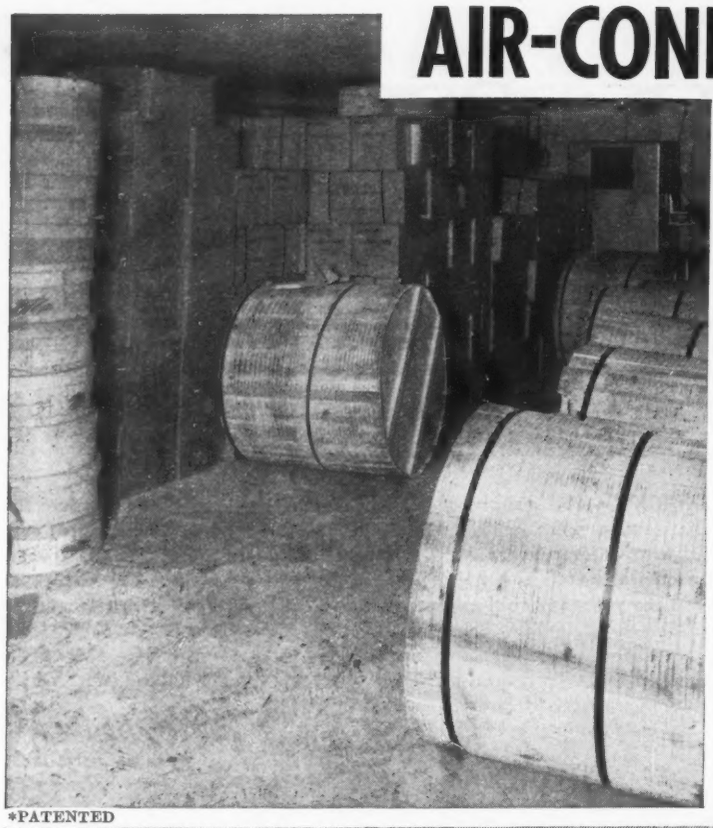
CHLOROPHYLL has been shown in recent investigations to have medicinal value in combating deep-lying infections in the cleansing of wounds, and in the relief of chronic sinus conditions and common head colds. It is also stated to be effective in controlling the offensive odor from certain anaerobic infections. (286)

ACRYLIC RESIN and mixed lower alipathic acid esters, such as cellulose acetate-butyrate or cellulose acetate-propionate, are stated to produce tasteless and odorless compositions suitable for coating the inside of metal food containers, according to a recent United States patent. (287)

Every effort will be made to furnish additional information on these articles. Where such information is not obtainable, we will refer inquiries to the original source of the article. Write to National Can Corp., 110 E. 42nd Street, New York City. Please mention the number at end of article—also name of the magazine you saw it in.

(Advertisement)

AIR-CONDITIONED STORAGE



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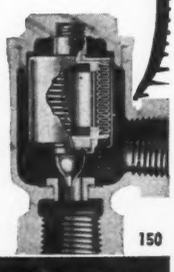

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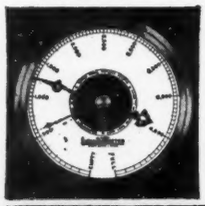

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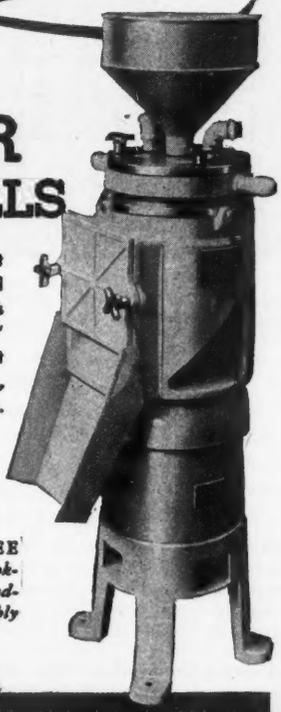

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What every plant operator should know about GLASS PIPING!

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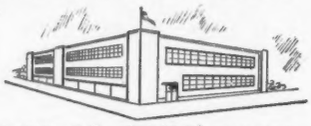
Glass-making materials are still fairly plentiful. And many food plant operators are discovering that PYREX Brand Piping not only solves piping shortage problems but, also, often does a better job than the piping formerly used.

We do need priority ratings that enable us to get accessories (flanges, gaskets), also to assign necessary labor, and to establish your order in our production line. With such priorities we have been making 6 to 8-week deliveries.

Available sizes and lengths: 1″, 1½″, 2″, 3″, and 4″ diameters; any length from 6 inches to 10 feet (longer lengths on special request). There are corresponding ells, tees, return bends, and reducers.

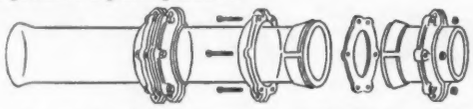
Accessories: Joints are compression type—with conical pipe ends compressed to a self-centering gasket by metal flanges and clamping bolts. We supply gaskets of materials suited to the product you want to convey.



WHERE DOES IT GIVE BEST SERVICE?

Wherever product purity is essential or corrosion is troublesome . . . wherever ease of cleaning is a factor . . . wherever management takes pride in its modern plant equipment . . . there PYREX Piping is ideal.

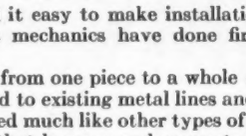
Food and beverage plants use it because it is easy to clean and operators can *see* when it is clean—because it can be flushed with steam or strong, hot cleaning solutions without danger of breakage from thermal shock. They use it to demonstrate visually to visitors what is taking place inside the pipe lines. They use it because it helps to produce a purer product.



IS IT EASY TO INSTALL?

Plant workmen find it easy to make installations themselves. Recently, green plant mechanics have done first-rate installations with PYREX Piping.

You may install from one piece to a whole system—for PYREX Piping may be joined to existing metal lines and equipment. And it is hung and supported much like other types of piping. (See photo). We do recommend that hangers and supports be padded, to minimize scratching.

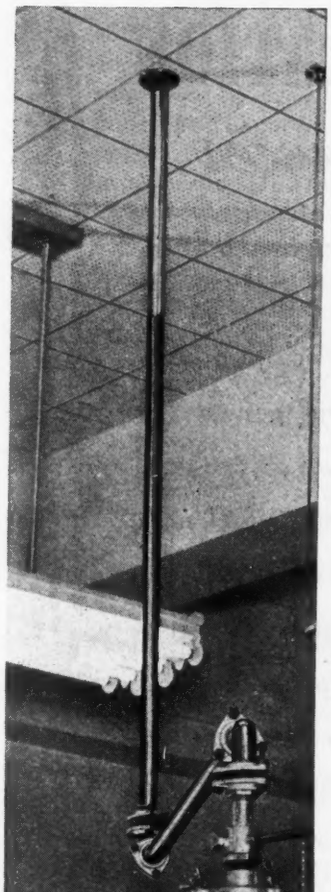


WILL IT STAND UP MECHANICALLY?

Yes. PYREX Piping is recommended for working pressures up to 100 p.s.i. But glass in this form is *not* as strong as metal. So, care must be taken to avoid installation strains or sharp impact. Nearly 20 years of service under all kinds of plant conditions have proved that only simple common sense and reasonable care are required to handle PYREX Piping without trouble. The glass itself, incidentally, is very hard—about twice as resistant to abrasion as ordinary plate glass. You can install and use PYREX Piping with confidence.

WRITE FOR PIPING BULLETIN

Watch this magazine for further information on "What every plant operator should know about Glass Piping." And write for PYREX Piping Bulletin 814. Industrial Division, Corning Glass Works, Corning, N. Y. Branch Offices: New York, 718 Fifth Ave., Chicago, Merchandise Mart.



WHAT DOES IT COST?

The initial cost of PYREX Piping (accessories included) is about the same or less than the cost of full-weight copper or brass piping, in comparable sizes, and is considerably less than the cost of stainless steel.

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That was the problem Standard Oil technicians started out to solve. And the new "heat-proofed" STANOLUBE H. D. is their answer.

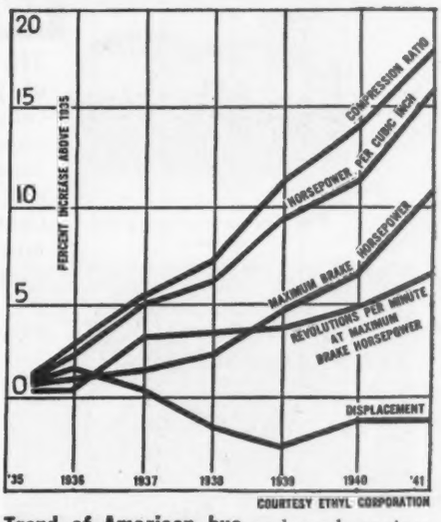
Cleans Engines . . . There are motor oils that partly solve the oil oxidation problem by loosening sludge deposits, and by keeping oxidized parts of the oil in suspension until they are removed by draining (a detergent action). But the rise in operating temperatures of heavy duty gasoline engines and the high temperatures in Diesels required *more* protection—an oil that would resist oxidation—a *heat-proofed* oil.

This is accomplished by combining, in Stanolube H. D., a special petroleum-base inhibitor, developed in Standard Oil laboratories, with a highly refined stock. The resulting oil has *both a detergent* action and unusual *resistance to oxidation,* even at temperatures above those encountered in present day engines.

This means that Stanolube H. D. practically eliminates troublesome varnish formation and other engine deposits, along with the resulting clogged oil lines and screens, and dirty filters—conditions that cause stuck valves and rings, bearing failures and excessive engine wear.

. . . doubles bearing life

Fleet Conservation Service more than doubled precision insert bearing life on Bringwald's Transfer Company fleet, Vincennes, Indiana. W. J. Bringwald (right), owner of the fleet, and Standard Automotive Engineer J. A. Mowbray examine a bearing which had been damaged by sludge and varnish formation in the engine before the Engineer worked with the fleet maintenance men and eliminated the trouble.



Trend of American bus and truck engines from 1935 to 1941, showing some factors contributing to higher engine heats.

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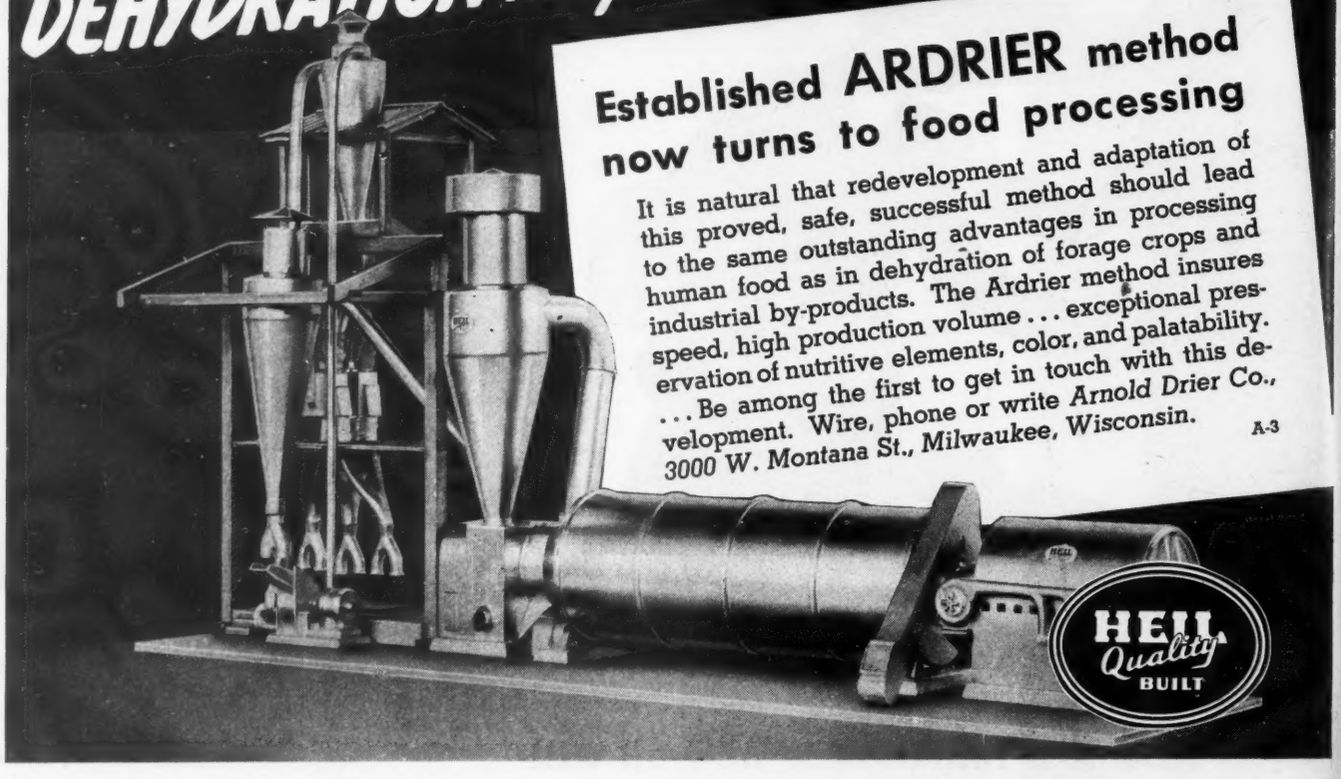

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It is natural that redevelopment and adaptation of this proved, safe, successful method should lead to the same outstanding advantages in processing human food as in dehydration of forage crops and industrial by-products. The Ardrier method insures speed, high production volume . . . exceptional preservation of nutritive elements, color, and palatability. . . . Be among the first to get in touch with this development. Wire, phone or write *Arnold Drier Co.*, 3000 W. Montana St., Milwaukee, Wisconsin. A-3

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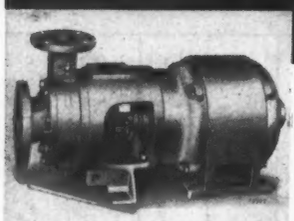

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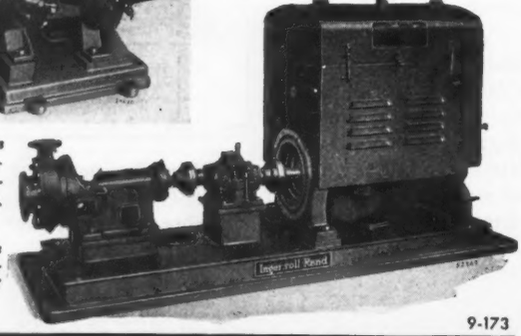

The Class TRV— compact turbine-driven unit.

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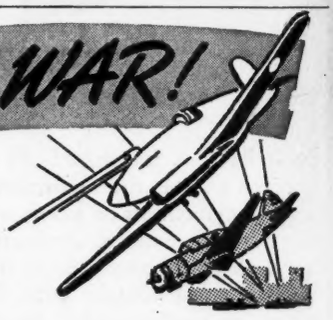

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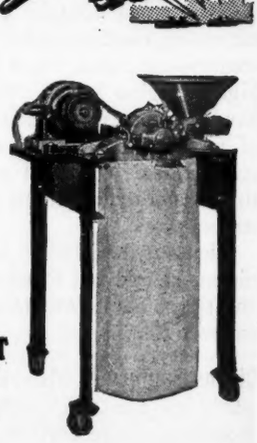

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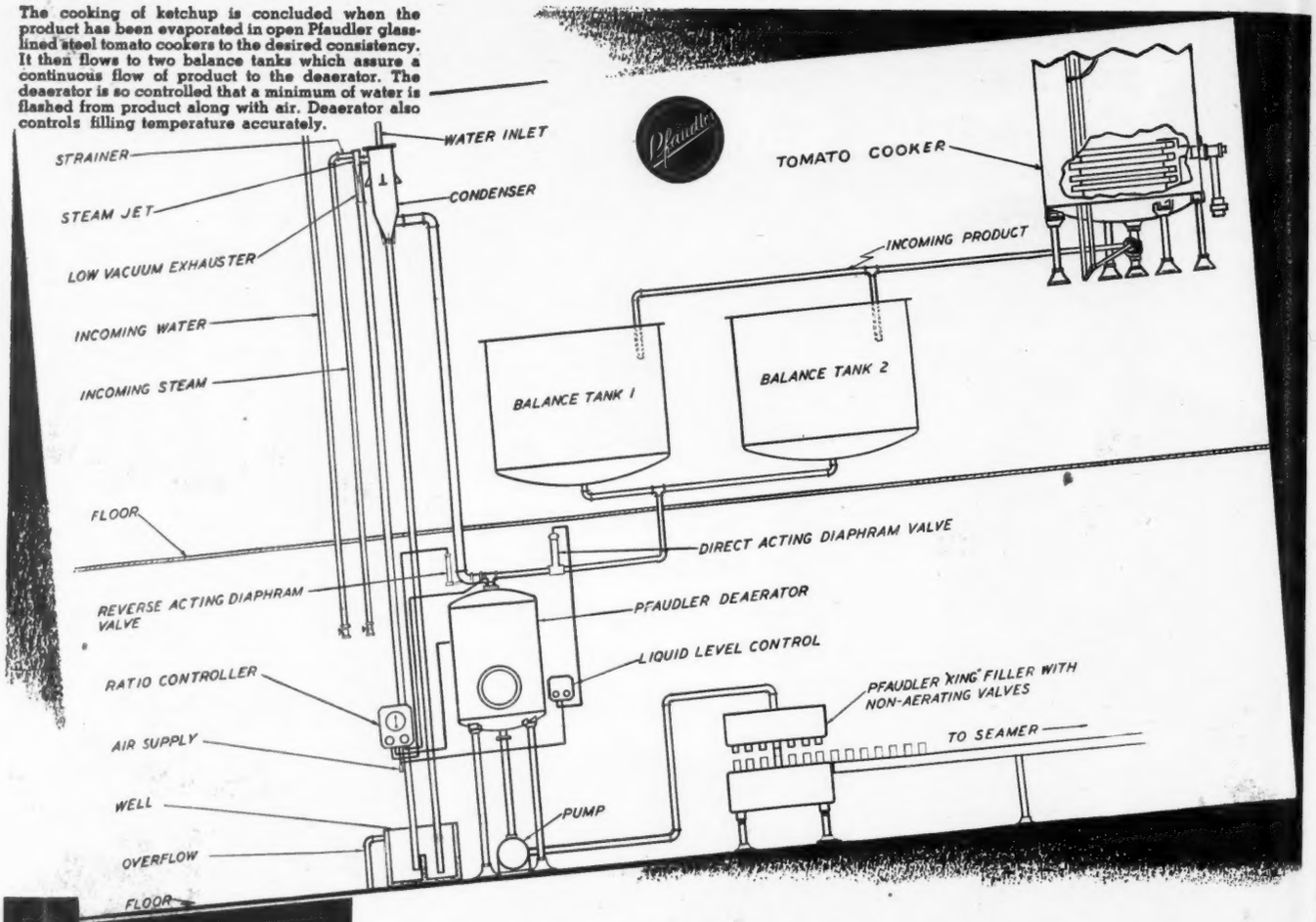
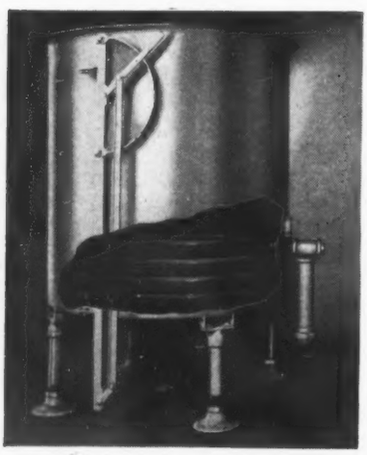
The cooking of ketchup is concluded when the product has been evaporated in open Pfaudler glass-lined steel tomato cookers to the desired consistency. It then flows to two balance tanks which assure a continuous flow of product to the deaerator. The deaerator is so controlled that a minimum of water is flashed from product along with air. Deaerator also controls filling temperature accurately.



Close-up view of Pfaudler Glass-Lined Steel Deaerator with ratio controller and temperature recorder.



Pfaudler Glass-Lined Steel tomato cookers are built in 400, 600, and 1000 gallons working capacity.

How to eliminate "BLACK NECK" in ketchup bottles

Glass-lined cookers plus Pfaudler Deaerator solves problem for large Eastern canner.

"Black Neck," the unsightly condition that occurs in ketchup and other food products when entrained air works out of the product, has a bad effect on flavor and keeping qualities as well.

Pfaudler Food Technologists have studied this problem thoroughly and as a result have developed the Pfaudler Deaerator, a unit that has proved its efficiency in heavy duty service in a variety of plants.

The importance of a properly designed deaerator cannot be over emphasized for it is well established that ketchup contains large amounts of air, not only that incorporated during the extraction process, but also within the intercellular spaces of the tomato itself. When the product enters the deaerator, it begins to boil because of the vacuum and then water vapor as well as the air is removed by flashing.

Proper control is essential at this point since this boiling off or flashing brings about a reduction in both volume and temperature. The amount of flash or boiling concurrent with temperature drop represents a critical point in production. Through our experience in building this type of equipment, you are assured of tested operating results.

The flow sheet shown above represents an operation at a large Eastern canning plant for the production of high quality ketchup. The initial cooking is done in Pfaudler tomato cookers, the product then flowing into two balance tanks for the purpose of maintaining a continuous flow through the Pfaudler Deaerator.

Pfaudler glass lined steel tomato cookers equipped with rapid heat cooking coils, reduce volume 61% in 30 minutes with 90 to 100 pounds of steam pressure in the coils. Glass-lined balance tanks and deaerators are related to this operation to assure an efficient production line.

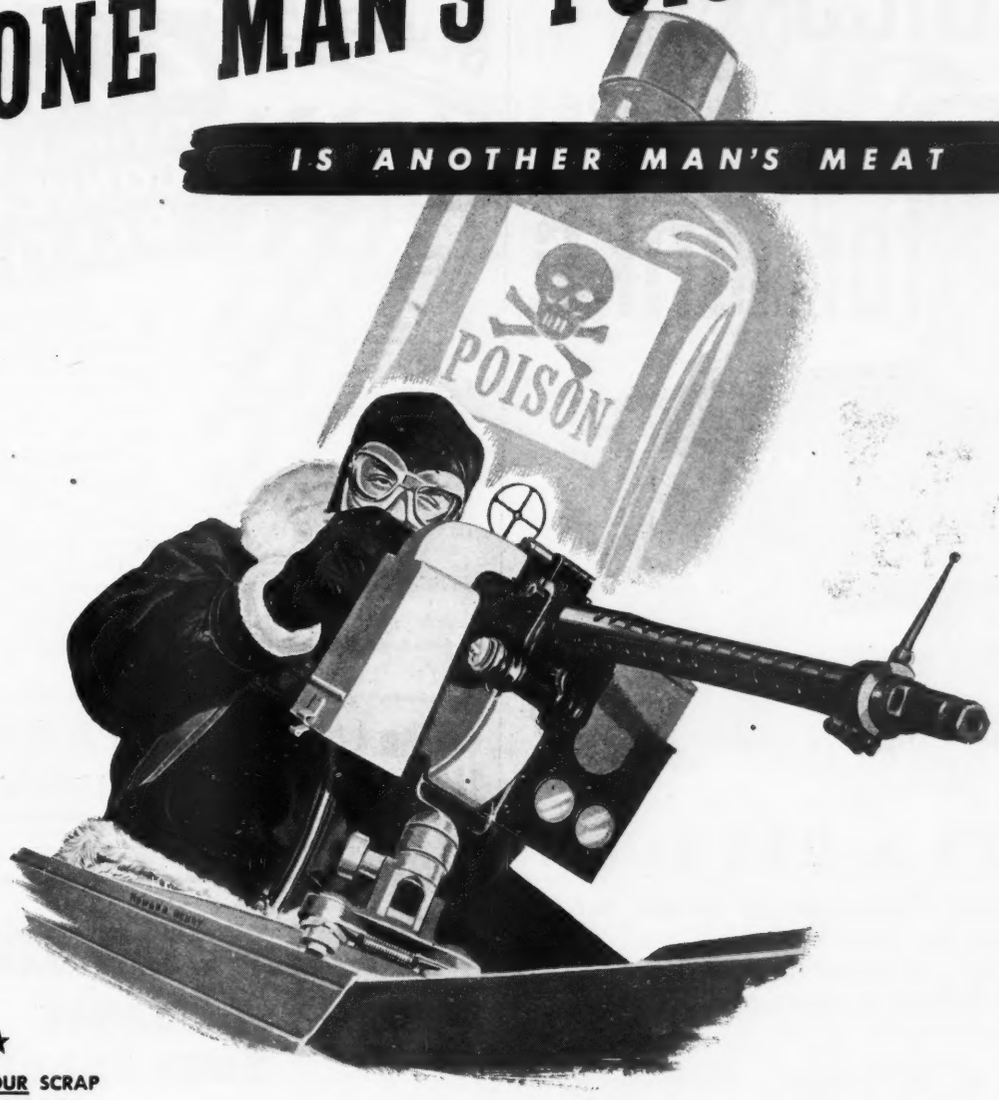
Ketchup is one of the products required by the Military and Lend-Lease. To make sure you have the necessary equipment to produce an increased supply in 1943, you should order now.

P F A U D L E R

The Pfaudler Co., Rochester, N. Y. Branch Offices: 330 West 42nd Street, New York; 1442 Conway Building, Chicago; 1325 Howard Street, San Francisco; 455 Paul Brown Bldg., St. Louis; 7310 Woodward Avenue, Detroit; 1318-1st National Bank Bldg., Cincinnati; 1228 Commercial Trust Bldg., Philadelphia.

ONE MAN'S POISON

IS ANOTHER MAN'S MEAT



★

THROW YOUR SCRAP
INTO THE FIGHT

★

American-made guns, tanks and planes are "meat" for the United Nations; "poison" for Hitler, Tojo and Benito. • Universal Cooler men (women) and machines are directly concerned with the uninterrupted flow of "Axis poison" . . . their contribution including hydraulic mechanisms for aiming turret guns on tanks, lubricating pumps for bombers, cooling equipment for machine guns, refrigerating units to protect vital food supplies from advance African bases to the defenses of Guadalcanal. • In addition to these precision-built war tools, there's an expanded engineering-research department to assure even more complete mobilization of personal abilities, plant facilities and production deliveries . . . *both before and after* today's "Axis poison" has had its lethal effect on Adolph and his cohorts.

UNIVERSAL COOLER

UNIVERSAL COOLER — WE SELL TO MANUFACTURERS ONLY

UNIVERSAL COOLER CORPORATION • *Automatic Refrigeration since 1922*

MARION, OHIO • BRANTFORD, ONTARIO

Bundles for Yanks

with the help of this

New 15 h. p. O&S Boiler!

An army moves "on its stomach" it's said. But our generals also know that the shirt on his back has plenty to do with bucking up a fighting man's morale! A trim soldier is a good soldier.

So when the Quartermaster's Corps ordered Mobile Laundry Units, ORR & SEMBOWER'S engineers were selected to design the boiler which is a vital part. Although developed expressly for Army use, the O & S boiler—with *built-in* condensate return system — promises wide application in your industry when Victory makes O & S boilers again available for all purposes. It offers . . .

★ 100 lbs. pressure from 60° water in 20 minutes!
★ Fully-automatic control!
★ Weight complete — 2100 lbs.!

O&S **ORR & SEMBOWER**
INCORPORATED
Builders of Better Boilers Since 1885

READING • PENNSYLVANIA

★ SPEED UP 8 DEHYDRATION PROCESSES

LA PORTE FLEXIBLE STEEL **CONVEYOR BELTING**

● This flexible, stretchless, slipless, non-weaving and longwearing conveyor belting is engineered for peeling, slicing, coring, bleaching, draining, rinsing, drying and packing tables and other dehydration processes.

The open mesh feature facilitates sterilizing with steam gun or scalding water.

The perfectly flat surface provides for carrying all types of containers empty or filled.

Ask your Supply House for LA PORTE Conveyor Belting in galvanized steel—available in any length and practically any width.

The LA PORTE MAT & MFG. CO.
BOX 124 LA PORTE, INDIANA

IMPORTANT

WHEN YOU CHANGE YOUR ADDRESS . . .

Unlike first-class mail, periodicals are not forwarded to a new address unless the subscriber pays the additional postage.
You can avoid this annoyance—and receive your copies of FOOD INDUSTRIES promptly upon publication, by advising us of any change of address at your earliest convenience.

NAME .....

NEW HOME ADDRESS.....

CITY & STATE .....

PRESENT POSITION .....

COMPANY .....

OLD ADDRESS.....

CITY & STATE.....

FOOD INDUSTRIES
330 West 42 Street New York, N. Y.

Wire Stitched Shipping Containers Best Protect Your Goods in Transit or in Storage

Bliss Heavy Duty Bottom Stitcher

Latham Bottom Stitcher

Regular Slotted Containers with bottoms wire stitched are widely recognized as the strongest, most rigid and dependable containers available. Wire stitching utilizes the entire strength of the board and is unaffected by moisture conditions in storage or transit.

For your stitching equipment, it will pay you to investigate the machines illustrated here, before you buy.

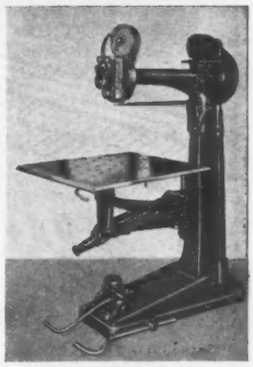
THE BLISS HEAVY DUTY BOTTOM STITCHER is recommended for heavy duty, high speed, continuous production. Favorably known as the fastest, strongest, most durable and dependable Bottom Stitcher built.

IMPROVED LATHAM BOTTOM STITCHER is a moderate priced machine, recommended for stitching the lighter grades of corrugated and solid fibre containers, in all the usual sizes which do not require the heaviest kind of stitching. Has many features heretofore found only in the highest priced machines.

THE BLISS TOP AND BOTTOM STITCHER. Some products must now be shipped in completely wire stitched containers. This stitcher is recommended for plants or departments where one machine will handle the quantity of bottom and top stitching needed. Quickly changed for bottom or top stitching. Counterbalanced table for easy raising and lowering.

FOR STITCHING FILLED BAGS, the Boston Portable Bench Stitcher has been found practical and convenient, as it can be readily moved to the work to be stitched. Operates from light socket—solenoid operated foot pedal.

ASK FOR LITERATURE ON ANY OF THESE MACHINES



Bliss Top and Bottom Stitcher

Boston Portable Small Bag Stitcher

DEXTER FOLDER COMPANY

330 West 42nd Street, New York

Chicago — Boston — Philadelphia — Cincinnati

Frozen Foods Directory

This Directory is the most comprehensive "quick" picture of activities in the Frozen Foods Industry yet published. In addition to listing the names of the companies, the following data is given for the majority of them:

1. ***WHERE* the freezing is being done!**
2. ***HOW* it is being done — what system is used!**
3. ***WHAT* products are being frozen!**
4. ***BRAND NAMES* of frozen foods!**
5. ***THE TYPE* and size of containers and packaging materials being used!**
6. ***The QUANTITIES* frozen in the past!**
7. ***THE SCHEDULED PRODUCTION* for the future!**

If you want to know what's going on in the Frozen Foods Industry—see this "Frozen Foods Directory." Now available at 35¢ per copy.

Note—10 or more copies to one address—25¢ each

FOOD INDUSTRIES

Department FD

330 West 42nd Street, New York, N. Y.

For "Glassed" Syrups

HOT PACKED

Whether you are changing over to glass containers or have always packed in glass, consider carefully the Gutmann Filma-Seal Closure.

Filma-Seal*

CAP AND SEAL APPLIED AS ONE

It holds the vacuum and bars the entrance of mould spores. It provides the double defense, tamper-proof package to assure full quantity and original quality intact to consumer.

Filma-Seal comes *in* the Gutmann cap and is applied in one operation with the screw cap.

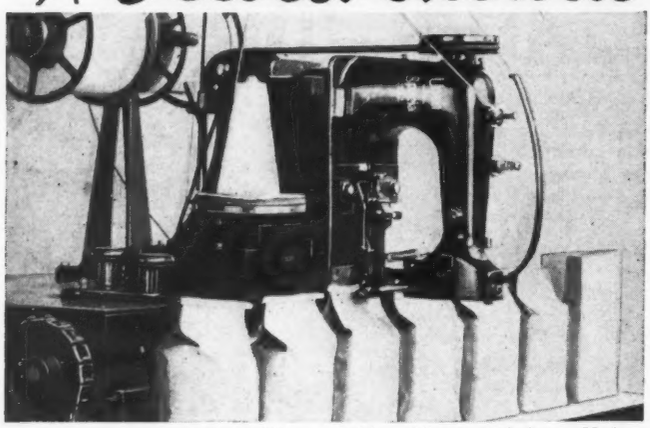
(*U. S. Pat.)

FERDINAND Gutmann & COMPANY

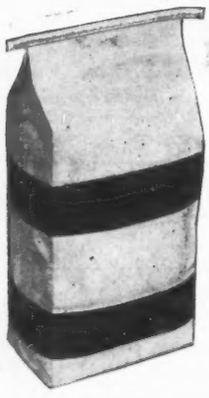
SINCE 1900

3611 14TH AVENUE • BROOKLYN, N. Y.

PAPER BAGS with Sewed Closures



The machine illustrated is a Union Special Style 60000 C Sewing Head which applies a narrow tape on each side of the top of the bag and automatically trims bag top and cuts the tape between bags. Tight, sift proof closures assured.



Solution to MANY CONTAINER PROBLEMS

THE use of paper bags with Dubl-Tape sewed closures produced on Union Special bag closing machines, is a highly effective method of packaging, particularly today with wartime container material scarcities. It offers these important advantages:

1. **Eliminates use of scarce materials.**
2. **Requires minimum addition of new machinery.**
3. **Easily adaptable to existing production systems.**
4. **Simple to operate; high production; low cost.**
5. **Provides neat, durable containers.**
6. **Inexpensive particularly as compared with many other systems.**

Write today for complete data on Union Special Bag Closers for your job. UNION SPECIAL MACHINE COMPANY, 426 N. Franklin St., Chicago, Illinois.

Union Special

INDIVIDUALIZED EQUIPMENT ANSWERS the CHALLENGE of NECESSARY CONVERSION

Every food manufacturer today is racing with the rapid developments created by the War in the food industry. He must have equipment built to keep pace with his changing needs—individualized equipment designed especially to meet his requirements.

KOVEN's expert engineers are ready with effective and economical solutions to problems created by new wartime demands made on food producers. Koven equipment is designed by expert engineers to meet specific needs of individual manufacturers—designed for *you* to keep your plant running at full speed.

Call us today for a consultation on your problem.

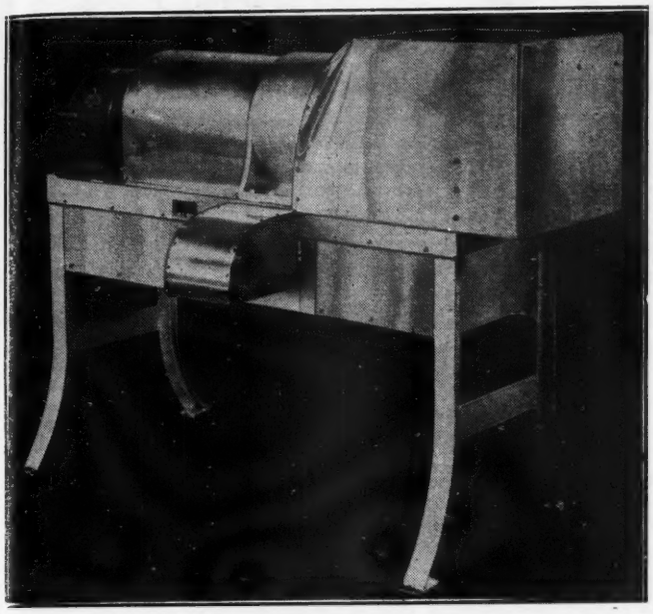
Among the many KOVEN products:

Stainless Steel
Aluminum Sheet Fabrication
Boxes, Tote, Waste Cans
Chemical Apparatus
Coils and Pipe Bands
Copper Sheet Fabrication
Galvanizing Work
Mixers, All Kinds
Monel Metal Fabricator
Pails, Special Heavy
Pans, All Types, All Metals
Sinks, Scullery and Factory
Tables, Galvanized or Monel
Tanks, All Types, All Metals
Kettles, All Types, All Metals

WATERFILM Industrial Heating Boilers

PLANTS:
Jersey City, N. J. Dover, N. J.

L. O. KOVEN & BRO. INC.
154 Ogden Ave.
Jersey City, N.J.



Urschel Model "B" Dicer
and Strip Cutter

SOLD BY
REPUTABLE SALES REPRESENTATIVES
Manufactured by

URSCHEL LABORATORIES, INC.
VALPARAISO, INDIANA

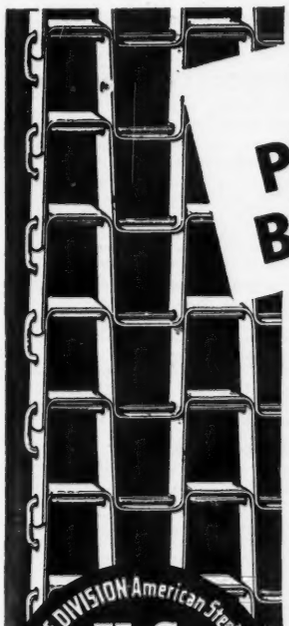
For Vegetable Dehydration

The Urschel Model "B" Dicer and Strip Cutter produces the uniform pieces of vegetable necessary to uniform drying. The capacity ranges to 6 tons per hour varying with the size of the cuts. The machine is easy to keep clean and operating maintenance is low.

Slices can be made from 1/16" to 7/16". 1/4" and 3/8" dices are standard.

1/8", 5/32", 3/16", 1/4", 5/16", and 3/8" strip cuts are standard. Strip cuts can be cut in various specified lengths.

All root vegetables can be cut in any of the above sizes. Celery, onions, and cabbage can be cut in certain sizes only.



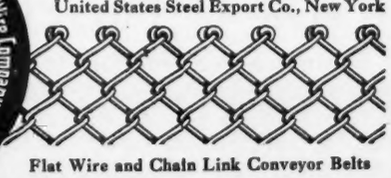
PREVENT PRODUCTION BOTTLENECKS

—with these durable conveyor belts!

Water, steam, temperature changes and many other causes of conveyor belt troubles are readily overcome by using Cyclone Metal Conveyor Belts. These sturdy belts are flexible, porous, heat-resistant and sanitary. Carry heavy loads without breaking. Flat Wire and Chain Link types—in a variety of weights, widths, and sizes of mesh. Write for information and prices.

CYCLONE FENCE DIVISION
(AMERICAN STEEL & WIRE COMPANY)
Waukegan, Illinois
United States Steel Export Co., New York

USS CYCLONE 'Red Tag' METAL CONVEYOR BELTS
CYCLONE FENCE DIVISION American Steel & Wire Company
UNITED STATES STEEL CORPORATION SUBSIDIARY



Flat Wire and Chain Link Conveyor Belts

UNITED STATES STEEL

GUARANTEED
TO MEET THE CONDITIONS FOR WHICH THEY ARE SOLD ...

Made in all types—for all purposes—in stainless steels, acid resisting bronze, nickel, lead, or any alloy. Frederick Pumps are an old favorite of the food industries . . . built by a maker who backs them unconditionally!

Frederick CENTRIFUGAL

PUMPS

The FREDERICK IRON & STEEL CO., Frederick, Md.

SEARCHLIGHT SECTION

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:

10 cents a word, minimum charge $2.00.
(See ¶ on Box Numbers.)
POSITIONS WANTED (full or part-time salaried employment only), ½ above rates.
PROPOSALS, 50 cents a line an insertion.

INFORMATION:

BOX NUMBERS in care of any of our New York, Chicago or San Francisco offices count 10 words additional in undisplayed ads.
DISCOUNT of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED—RATE PER INCH:

The advertising rate is $6.00 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.
AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page. F.I.

NEW ADVERTISEMENTS received by 10 A.M. February 22nd will appear in the March issue, subject to limitations of space available

POSITIONS VACANT

PRODUCTION MANAGER for Dehydration plant in Los Angeles. State detailed information as to experience, salary, etc. P-643, Food Industries, 68 Post St., San Francisco, Cal.

CANDY COATER for coating tablets and pills. Must have some experience either in pill and tablet or hard candy coating. For permanent position in pharmaceutical house in Philadelphia. Give full particulars as to age, experience and draft classification. Write Sharp & Dohme, Inc., P. O. Box 7259, Phila., Pa.

FOOD CHEMIST — Must have experience in manufacturing bakers' jellies, preserves, flavors, baking powder, pie filling and bakers' specialties. State experience; salary desired—progressive middle eastern organization. P-112, Food Industries, 520 N. Michigan Ave., Chicago, Ill.

Man experienced in food processing, preferably dehydrating. Must have experience in preparatory steps of canning for vegetables. Man to fit in general organization of expanding business. Salary commensurate with experience and ability to fill position. Write details of experience, age, references, etc. Box 426, Hickesville, L. I., N. Y.

WANTED for very substantial and progressing meat canning plant in Eastern Area. Production manager and plant superintendent for permanent position with good salary and interesting opportunity for future. Should be thoroughly experienced in all plant operations, familiar with Government requirements. Write giving full particulars stating experience, age, draft status, and required salary. P-111, Food Industries, 330 W. 42nd St., New York, N. Y.

WANTED: Experienced production superintendent for canning company located Eastern Shore, Maryland, packing Tomato products, Beets and other vegetables. P-110, Food Industries, 330 W. 42nd St., New York, N. Y.

MANUFACTURER interested having experienced men making syrups, gelatin desserts, other specialties. Permanent position; excellent opportunity for advancement. When writing, give complete details. P-108, Food Industries, 330 W. 42nd St., New York, N. Y.

PRODUCTION MANAGER, Experienced, for egg dehydrating plant—spray system. While egg drying experience is preferred, would consider man with powdered milk experience. Must be qualified to handle large organization. Draft exempt. State full particulars including experience, references, when available, salary desired. P-102, Food Industries, 330 W. 42nd St., New York, N. Y.

MAN to supervise packing, sub-dividing, and labeling department in chemical in Metropolitan New York. Must be experienced in packaging of chemicals for food and drug trade. Draft deferred. Write, giving full particulars, experience and salary desired. Replies to P-104, Food Industries, 330 W. 42nd St., New York, N. Y.

SUPERINTENDENT for chocolate factory. Experienced preferred. Must be graduate in Agricultural or Bio-Chemistry (with preferred minors in Bacteriology or Dairy Husbandry). Draft status 3-A, not over 50 years. Give complete details of academic training, experience, and personal qualifications. Send photograph. State salary. P-105, Food Industries, 330 W. 42nd St., New York, N. Y.

POSITIONS WANTED

GRADUATE CHEMICAL ENGINEER seeks opportunity in dehydration or other food processing field; 6 years experience inspecting foods and food plants. Married, age 30, 2 children, 3A classification. PW-113, Food Industries, 330 W. 42nd St., New York, N. Y.

Wanted

FOOD PLANT SUPERINTENDENT

An experienced man required familiar with general line processing of high grade food products including jams, jellies, preserves, salad dressings, olives, etc. Long established company with national distribution producing several millions worth of goods annually. Salary and bonus plan commensurate with ability of applicant. Your reply will be treated strictly confidentially and will only reach the Chairman of our Board for his study. Our own officials have knowledge of this advertisement.

P-106, Food Industries
520 No. Michigan Ave., Chicago, Ill.

POSITIONS WANTED

PRODUCTION MANAGER—M. I. T. graduate, plant manager (1000 employees) experienced in food freezing and canning, excellent production record, early thirties; desires permanent responsible position. PW-103, Food Industries, 330 W. 42nd St., New York, N. Y.

FOOD TECHNOLOGIST-MANAGER—Age 36, graduate of M. I. T. Four dependents. Thoroughly experienced in all phases of operating and quality control of production of quick frozen and canned vegetables. Some vegetable dehydrating experience. PW-109, Food Industries, 330 W. 42nd St., New York, N. Y.

FACTORY SUPERINTENDENT or Manager, for preserves, jellies, marmalades, fruit butters, honey, mince-meat, pancake syrups, extracts, mayonnaise, salad dressing, peanut butter sauces, ketchup, canned soups, stews, meats and other food products. Experienced in buying of raw materials, manufacturing, packing, costs, shipping and some selling for 18 years. Married, age 36, draft class 3-B. PW-107, Food Industries, 520 N. Michigan Ave., Chicago, Ill.

FREE BULLETIN

"TRADING POST" 24 pages, 4 x 9, indexed listing of over 70 kinds of industrial, structural and transportation used material and equipment including over four pages of items wanted. Write Iron & Steel Products, Inc., Chicago (Hegewich Sta.) Ill.

WANTED

NAILING MACHINES WANTED—We want Morgan or Doig Nailing Machines at once. State make, size, best cash price. Chas. N. Braun Machinery Co., Fort Wayne, Indiana.

WANTED

ANYTHING within reason that is wanted in the field served by Food Industries can be quickly located through bringing it to the attention of thousands of men whose interest is assured because this is the business paper they read.

WANTED

Wanted to buy for cash, Dutch Processed Cocoa in any quantity from 1 barrel to car lot, or your unused quota of Cocoa or Chocolate.

BRADWAY CHOCOLATE COMPANY
New Castle, Indiana

WANTED

Siphon filling machines 6-, 8-, or 10-tubes, suitable for still drinks, with glass-lined or stainless steel lined tanks, automatic floats of non-corrosive material, filling tubes ½" or 9/16" diameter, nickel alloy or stainless steel preferred; machines must be in first-class condition. What is your price, crated? Give full details as to make and condition in your first letter.

W-101, Food Industries
330 W. 42nd St., New York City

HIGH PRICES

Send us your list of machine tools, electric motors or other idle equipment for prompt action.

GEORGE GALES
1133 Broadway New York City, N. Y.
Tel—CHelsea 3-3600

OUR 49th BUSINESS YEAR

FIRST and LARGEST DISTRIBUTOR of FROZEN FOODS

in Baltimore-Washington territory
Specializing in Hotel, Restaurant & Institutional trade

WE SOLICIT OFFERINGS OF QUALITY PACKS

THE W. B. CASSELL CO.

1027-43 S. Howard St. Baltimore, Md.

MEETING THE NEW EMERGENCY "CONSOLIDATED"

Speeds Production for the

"COMMISSARY of DEMOCRACY!"

EQUIPMENT FOR

DEHYDRATION • AIR CONDITIONING • REFRIGERATION • PACKAGING • ETC.

DRYERS

1—PROCTOR & SCHWARTZ, 9- Truck Atmospheric Dryer, 40 trays per truck, 1562 sq. ft. tray surface.

4—ATMOSPHERIC DRUM DRYERS; 1—3'x 9' Bronze double drum; 2—Anco 4'x9' single drum; 1—4'x8'.

8—ROTARY VACUUM DRYERS; 1—BUFFALO 5'x30"; 5—DEVINE 4'x25'; 1—DEVINE 4'x30'; 1—STRUTHERS WELLS 30"x12'.

2—ROTARY VACUUM DRUM DRYERS; 1—Buffalo 40"x40" Single Bronze Drum; 1—Devine 3'x9' Double Bronze Drum.

8—ROTARY DRYERS; 3'x20', 40'x30', 5'x 30', 6'x40'.

Miscellaneous: Tunnel, Apron, Conveyor, Rotary Direct Heat, etc.

EVAPORATORS

2—All-copper EVAPORATORS: 1—Badger Triple 450 sq. ft. per effect; 1—Standard triple 450 sq. ft. per effect; 1—Standard Triple 350 sq. ft. per effect.

10—EVAPORATORS—single, double, triple and quadruple effects, standard makes.

VACUUM PANS

1—Stokes 400 gal. copper jacketed Agitated—heavy duty.

3—Copper Jacketed VACUUM PANS: 1—Rogers 5'; 1—Oats 30" dia. x 5'6' high; 1—60 gal; 1—Burkhard 40 gal.

QUADRUPLED PRODUCTION NEEDED

America has become MORE than "the Arsenal of Democracy". Today America has undertaken the gigantic task of helping to win the war with FOOD for our Armies, for our Allies, and for occupied countries. The occupation of North Africa ALONE resulted in a quadrupled expansion demand for Dehydrated foods—and that's only the beginning! The pressure is on Food Production to GET GOING. This means more equipment . . . and "Consolidated" is geared to supply such equipment, or find it for you.

IDLE FOOD EQUIPMENT PROLONGS THE WAR

No food plant, no smallest item of usable food processing equipment, can NOW be allowed to stand idle! "Consolidated" will PLACE needed food equipment where it is wanted—quickly. Our nationwide reputation and organization can rapidly liquidate an entire plant, either as a unit or piecemeal. Or we can perhaps REORGANIZE it—GET IT BACK INTO PRODUCTION quickly, effectively. No matter WHAT your food equipment problems call with confidence upon "Consolidated".

SAVE TIME TO SAVE AMERICA

PACKAGING MACHINERY

1—PNEUMATIC SCALE bottom Sealer, 2 stage Weigher, top Sealer Unit.

1—PNEUMATIC SCALE auto. Wax Liner.

1—Johnson Top & Bottom SEALER UNIT.

1—Stokes & Smith AUGER POWDER FILLER.

1—Johnson mod. JA CELLOPHANE WRAPPER.

1—PNEUMATIC SCALE 2 stage straight line Weigher & Filler, intake and outgo conveyor.

REFRIGERATING EQUIPMENT

3—Vilter AMMONIA COMPRESSSORS, twin horiz., 250 tons each, direct motor driven to West. 500 HP synchr. Motors, 3/60/440 V.

1—Vilter AMMONIA COMPRESSOR, 40 tons, motor driven with West. 100 HP 3/60/440 V.

LABELLERS

6—Wrap-around CAN or BOTTLE LABELLERS; 5 semi-automatic spot Labellers; 4—Automatic Rotary Labellers.

★ ★ ★ ★ ★ ★

4—300 gal. Copper closed tin-coated TANKS.

6—8 to 40 gal. PONY MIXERS.

15—DRY POWDER MIXERS, from 50 to 4000 lbs.

2—80-qt. Century 4-speed MIXERS, m.d.

1—Buffalo 24" VANILLA BEAN CHOPPER.

2—Karl Kiefer VISCO FILLING MACHINES.

11—FILTER PRESSES P & F; Recessed; to 42" Square.

1—20 gal. MONEL KETTLE, electrically heated.

1—1000 gal. horiz. glass lined TANK.

1—200-gal. vertical NICKEL TANK.

MISCELLANEOUS EQUIPMENT

1—80 gal. ALUMINUM JACK. KETTLE; 2—40 gal., 1—20 gal.

9—KELLY FILTERS, #150, #250, #450.

12—OLIVER FILTERS, 4'x6', 6'x6', wood and iron; 8'x8', 8'x12'.

Wanted: IDLE MACHINES

Machinery now standing idle in your plant may be the very equipment which is delaying vital defense production in some other factory. Remember—we buy Single Items and Complete Plants.

★ ★ ★ ★ ★ ★

1—ALUMINUM TRUCK TANK, 1100 gal., 10' 4" long.

50—25 gal. MONEL OPEN TANKS; 12—45 gal.

1—#6 SWEETLAND FILTER, 12 bronze leaves. 3" c.c.

17—Stainless Steel, Copper, Aluminum; Glass Lined; KETTLES and VACUUM PANS, up to 550 gal. cap.

2—Schultz-O'Neil PULVERIZERS.

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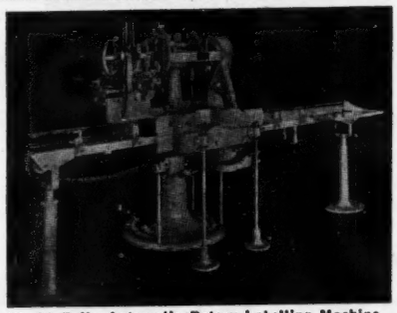

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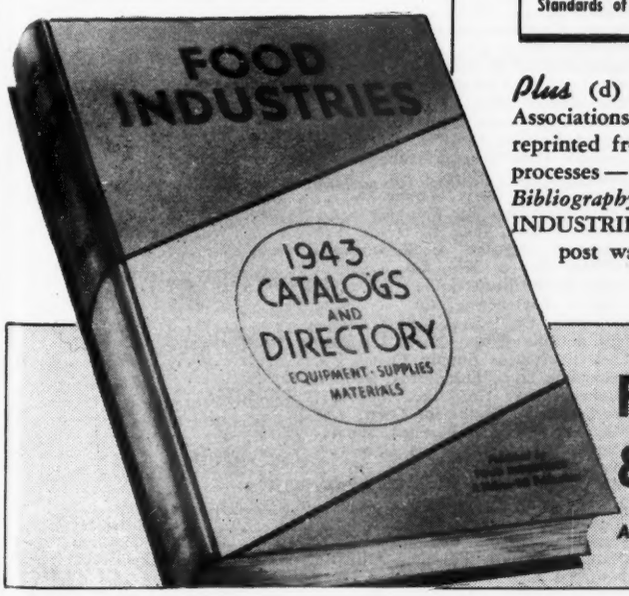

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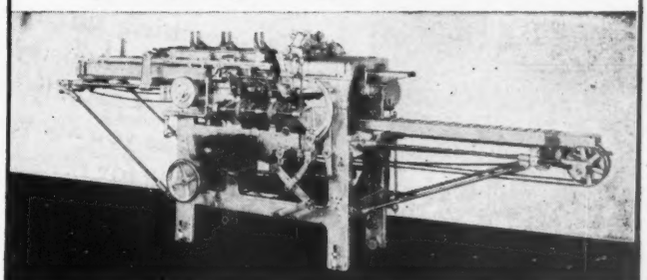
Prompt Shipment from 10 Strategically-Located Steel-Service Plants... Principal products include—Alloy Steels, Tool Steels, Stainless Steel, Hot Rolled Bars, Hoops and Bands, Beams and Heavy Structurals, Channels, Angles, Tees and Zees, Plates, Sheets, Cold Finished Shafting and Screw Stock, Strip Steel, Flat Wire, Boiler Tubes and Fittings, Mechanical Tubing, Rivets, Bolts, Nuts, Washers, etc. Write for Stock List. Joseph T. Ryerson & Son, Inc. Plants at: Chicago, Milwaukee, St. Louis, Detroit, Buffalo, Cincinnati, Cleveland, Boston, Philadelphia, Jersey City.

HIGH SPEED
WRAPPING MACHINES
for frozen foods



The "BATTLE CREEK" Model 46

FAST! ★ Wraps 60 to 80 cartons per minute!

FLEXIBLE! ★ Only 5 to 8 minutes time to change from one package size to another!

VERSATILE! ★ Handles any standard frozen food package from 12 ounces to 2½ pounds

AVAILABLE! ★ A limited number of these popular wrapping machines may still be built for properly qualified purchasers. For full details . . . . . .

WIRE OR WRITE
Battle Creek Wrapping Machine Co.
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17½ Billion Pounds of Meats for Civilians This Year

Civilian consumption alone calls for 17½ billion pounds . . . for Lend-Lease 3½ billion . . . for our fighting forces 3 billion. These tremendous quantities of meats, plus grains, fruits and vegetables, must be produced this year to carry on the United Nations' war effort.

Mixing is a most important step in the manufacture of many of these meat products. That is why Hottmann Mixers and other processing machines are now available only for war production purposes.

Your job, and ours, is to help win this war as soon as possible. May we suggest, however, that you do not wait until the shooting is over to make plans to meet post-war conditions?

Our 28 years' experience in designing and building food processing equipment is available, without obligation, to help you formulate such plans.

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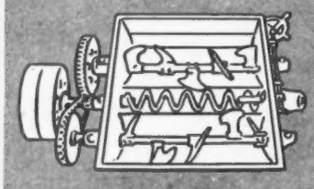
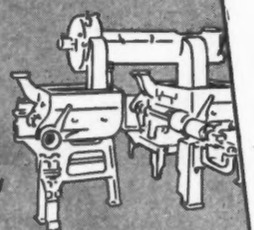
Far-reaching changes are taking place in all Industry today . . . nowhere more rapidly than in the food field . . . as you are well aware. Now is the time for research and development work . . . to make your plans for the future. Take advantage of Hottmann's broad experience in *mixing* . . . we are prepared to help you.

PUT YOUR MIXING PROBLEMS UP TO

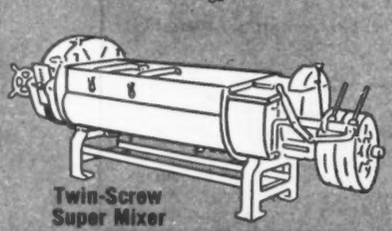
HOTTMANN



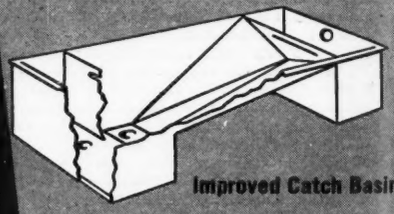
Mixer, Interior View



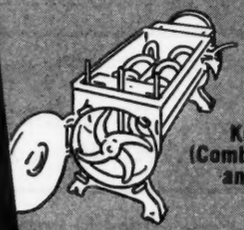
Yeast Machinery



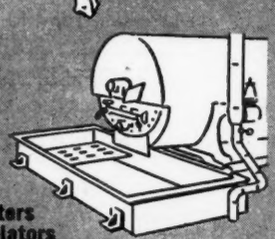
Twin-Screw Super Mixer



Improved Catch Basin



Kutmixer (Combined Cutter and Mixer)



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RECENTLY, one manufacturer after another has expressed amazement in just those words. They had no idea of the jobs that kraft paper packages and multi-wall bags are now performing.

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More Operating Hours

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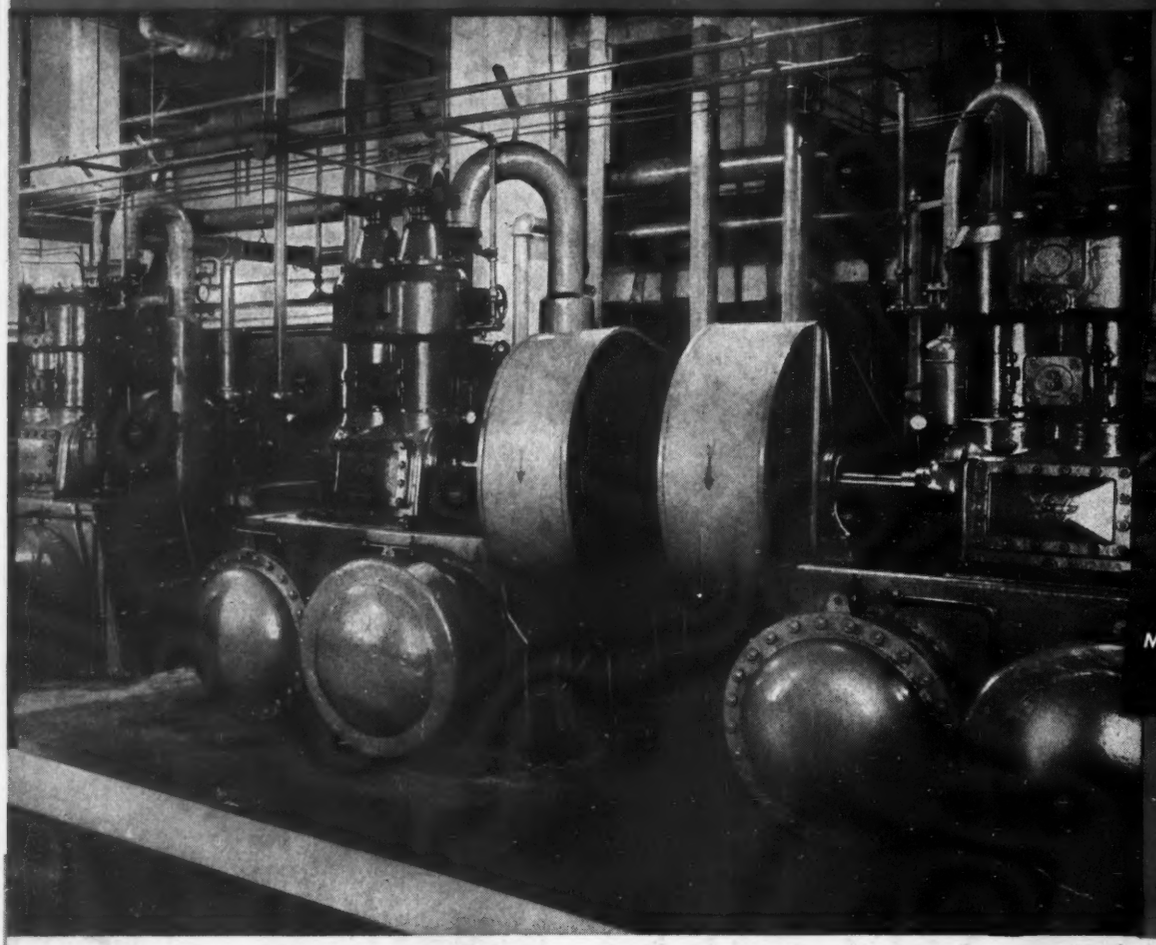

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